MV electrical network management

Easergy range

Flair 200C

SERIES 3

MV substation remote monitoring unit

User's manual

Schneider Electric

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Description of functions

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The Flair 200C is an efficient tool for reducing repair and fault finding times.
It improves quality of service for power distribution.

Main functions of the Flair 200C

These functions are available on one channel in the standard version and on 2 channels on option.

Detection of phase and earth faults and storage in memory

- 2 possibilities for fault detection:
  - ammetric detection
  - or, optionally, ICC detection for compensated neutral networks.
- Recording of the information coming from 6 digital inputs
- Sending commands via 3 outputs
- Remote data transmission.

It also has functions allowing improved network management and planning:

- Measurement and recording of load currents on the MV line
- Measurement and recording of the MV voltage from the LV voltage (if the power measurement option is installed)
- Calculation of power (P, S, Q), energy and power factor (if the power measurement option is installed).

Dated logging events:

Time-stamped chronological logging of events and measurements.
This information can be transmitted to the supervision centre and/or archived in logs for consultation and local downloading (in the form of .xls files), by connecting a microcomputer.

Backed-up power supply

In the event of a power outage, a lead battery provides a 4-hour power reserve. The power supply is checked constantly. Alarms can be sent to the Scada system in the event of:

- Immediate mains failure
- Charger fault
- Battery fault.

Local communication and communication with a remote supervision centre

The Flair 200C includes as a standard feature

- A USB port for communication with the local PC for consultation/configuration.

The Flair 200C can receive as optional features

- An Ethernet port for communication with the remote supervision centre and for access from the local consultation/configuration PC.
- One modem for remote communication with the remote supervision centre:
  - GSM/GPRS
  - GSM/3G - UMTS & HSPA + (3.75G), EDGE, GPRS & GSM
  - PSTN
  - Radio
  - RS485/RS422
  - RS232.
- A RS232 or RS485/RS422 modem can communicate in Modbus protocol with Sepam type local devices. In that case the Flair 200C plays the role of hub.
- All communication protocols can be used with the remote supervision centre:
  - IEC 870-5-101, IEC 870-5-104
  - DNP3, DNP3/IP
  - Modbus, Modbus/IP
  - Other protocols on request.

Time synchronization of the equipment

Time setting for event dating can be performed:

- By the laptop PC for consultation/configuration of the Flair 200C (manually or automatically with the PC time)
- By the remote supervision centre
- By SNTP synchronization from an Ethernet network (time setting precision of approximately one second).

Description of functions

IEC 61131-3 programmable logic controller

On option, the Flair 200C can include an IEC 61131-3 embedded virtual programmable logic controller.
A development platform (the RTU Control software supplied in appendix on the Easergy CD) makes it possible to design, simulate and test on a target programs written in the following PLC languages:

- SFC – Sequential Function Chart
- FBD – Function Block Diagram
- LD – Ladder Diagram
- ST – Structured Text
- IL – Instruction List

These PLC programs allow specific customized applications or additional functions to be implemented on the Flair 200C by combining or actuating existing Flair 200C variables or virtual variables to be created specifically for the PLC application.

Inter-equipment communication

The IEC 61131-3 programmable automatic control option also includes an inter-equipment communication function, allowing Modbus exchange, via a TCP/IP link, between Flair 200C devices connected to the same MV circuit. This communication allows exchange of a data table between these Flair 200C devices, in order to contribute, for example (without any other PLC than the Flair 200C's), to an automatic control function allowing detection and clearing of a current fault on an MV circuit.

Calculation formulae

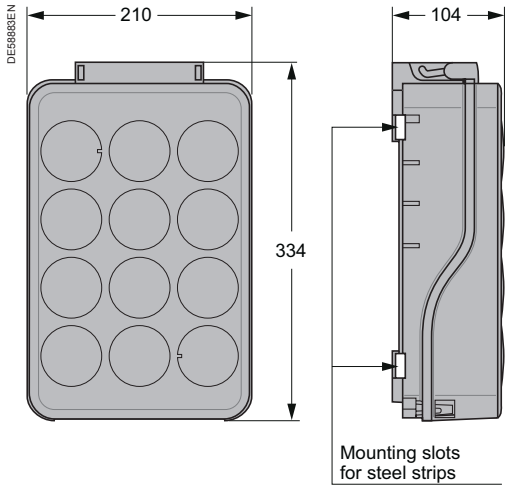
The calculation formulae are a standard feature of the Flair 200C.
They can be used in the Flair 200C to create new customized functions or applications not requiring writing of a program in PLC language.
The functions that can be used in the formulae are:

- Mathematical functions;
- Statistical functions;
- Logical functions;
- Time/date functions;
- etc.

These formulae make it possible, more easily than with a PLC program, to create logic equations based on combinations of variables. The types of variables that can be used are the same as for PLC programs (existing Flair 200C variables or virtual variables created specifically). This inter-equipment communication is typically used in applications of the self-healing network type.

(For more details regarding these three functions, refer to the specific "RTU Control & Formulae" manual – ref. NT00320-xx).

Mechanical properties



Dimensions and weight

- Dimensions: see diagram opposite
- Weight: about 2.5 kg depending on options.

Storage

- Service temperatures: –20°C to +70°C
- Storage temperatures: –40°C to +70°C

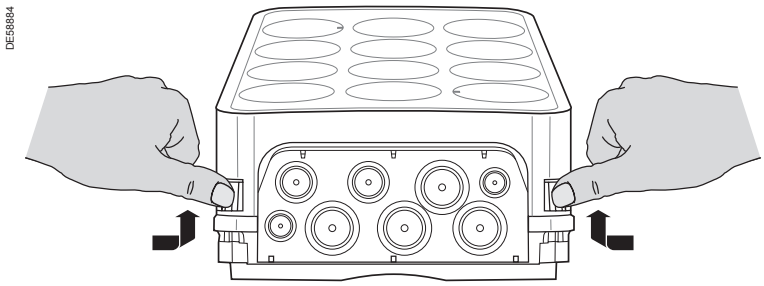
The device must be stored with the battery disconnected.
Do not leave the battery more than six months without recharging it.

Product identification

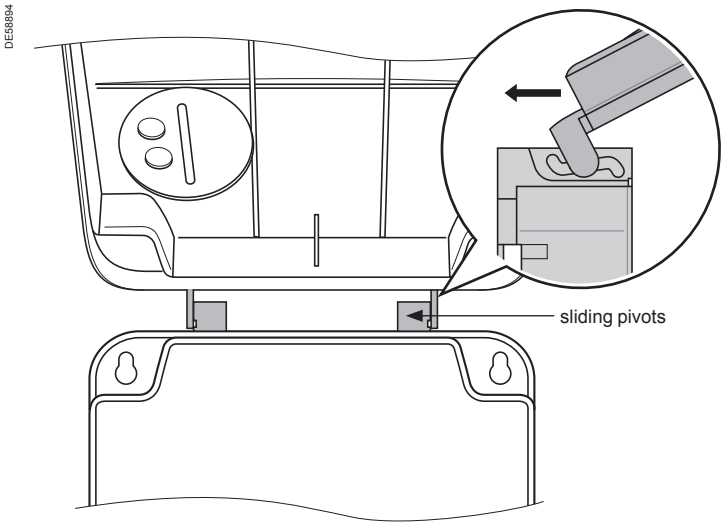
The serial number and product reference are indicated on a label located on the right-hand side of the base.

Enclosure mounting

Open the device using the clips located at the bottom of the enclosure.
To do so, push the clips inward while raising the upper part of the enclosure.

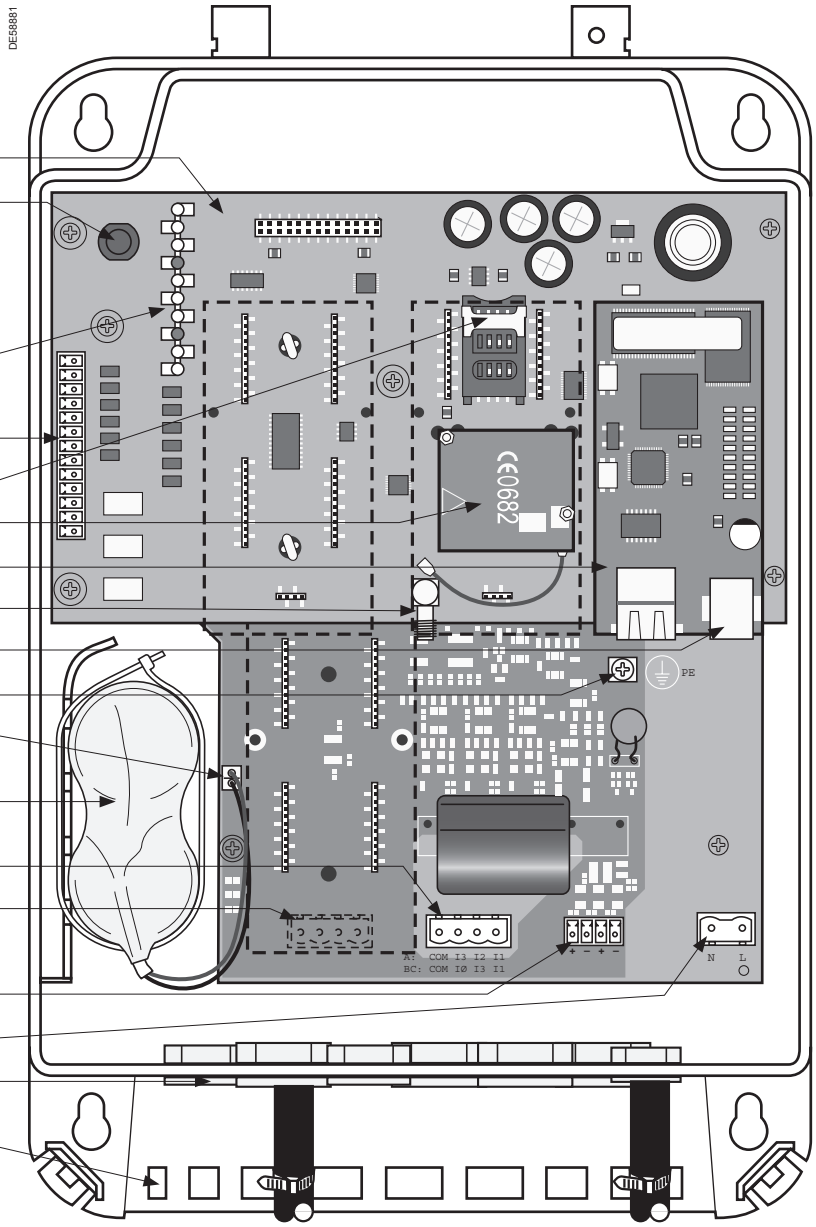


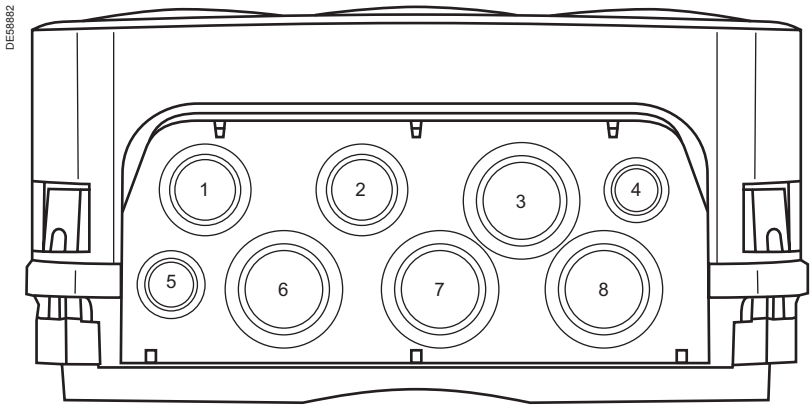
Open the enclosure as far as possible, then slide the two sliding pivots to the back of the enclosure to block it in the open position.
Fix the base with screws Ø 6 mm. A drilling template is supplied with the product.



Architecture

Location of Flair 200C components





Recommendation for use of cable glands:

1 *Modbus or Ethernet input/output or local port*
2 *GSM antenna*
3 *External indicator terminal*
4 *Earth*
5 *Channel 2 toroid input*
6 *Channel 1 toroid input*
7 *LV power supply input*

Current sensors

The Flair 200C is compatible with the current sensors of the Easergy Flair 2xx and Easergy T200 fault passage indicator range.

The Flair 200C is also compatible with all types of commercially available sensors.

■ MF1 and MFH standard split phase and zero sequence toroids

■ High-performance resin-coated phase and zero sequence toroids

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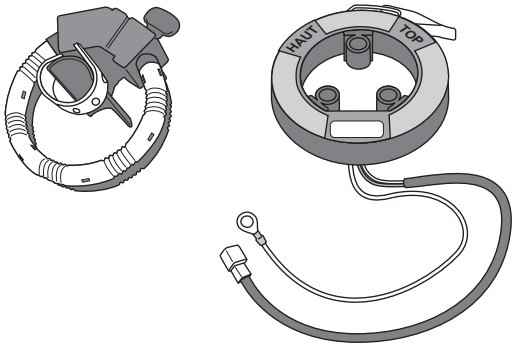

Connection of toroids to the Flair 200C

Depending on the type of kit, the setup will concern:
- 3 split phase toroids
- 2 split phase toroids + 1 zero sequence toroid
- 1 zero sequence toroid.

To connect the toroid connecting cable:
- Use a 4 x 1.5 mm^2 cable, U1000RO2V (not supplied)
- Insert the cable through the associated cable gland
- Tighten the cable gland.

The 4-pin connector of the cable coming from the toroids is to be connected to the current acquisition card for the channel in question (channel 1 or channel 2) in accordance with the following diagram.

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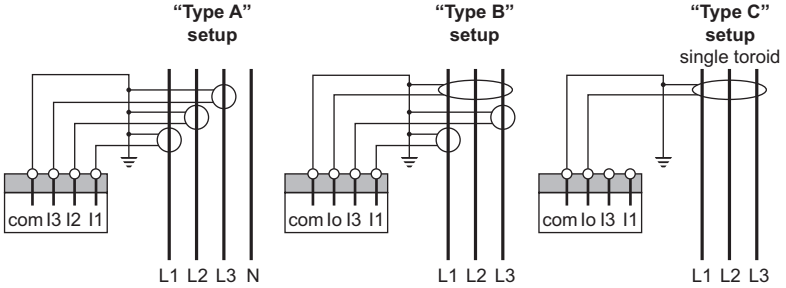

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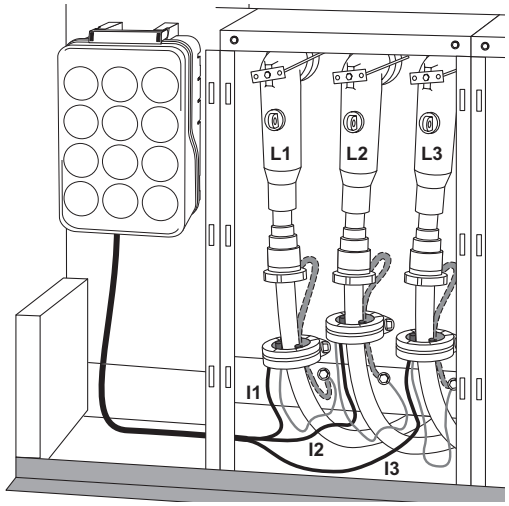


Installation of three split phase toroids

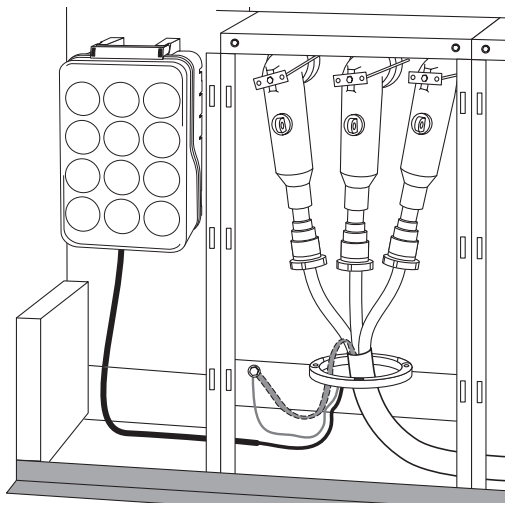
Installing toroids in the enclosure

When fitting the toroids on the cables, **it is essential to comply with the direction of positioning**: HAUT/TOP marking facing upward or identical colour facing upward.

NB: if the power option is installed: install the toroids in the enclosure complying with the phase order (phase 1 connected to connector I1, phase 2 connected to connector I2, phase 3 connected to connector I3 of the Flair 200C).

IMPORTANT NOTE:
- **The shielding of each MV cable must be re-inserted inside the corresponding toroid before being connected to earth (see diagram opposite).**
- **The low-voltage insulation of the Easergy toroids means they can only be used on insulated cables.**
- **Cables of voltage rating greater than 1000 V must have a shield connected to earth.**
- **The type A and B setups are not authorized on three-pole cables.**

DE58902



CORRECT setup with a three-pole cable

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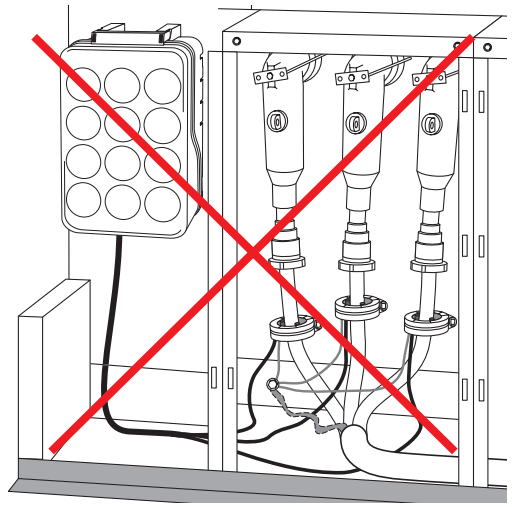
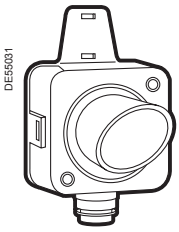
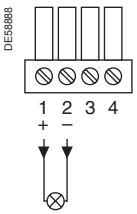


INCORRECT setup with a three-pole cable

Input/output wiring





Connecting an external indicator lamp

The external indicator lamp (optional) is used to indicate a fault current.

- Connection by 1.5 mm^2 cable (not supplied)
- Insert the cable via the corresponding cable gland on the base of the enclosure
- Connect the cable to the 2 screw terminals provided for the purpose.

⚠ **Caution: the terminals to be connected are polarized.**
Comply with the direction of connection "+" and "–".

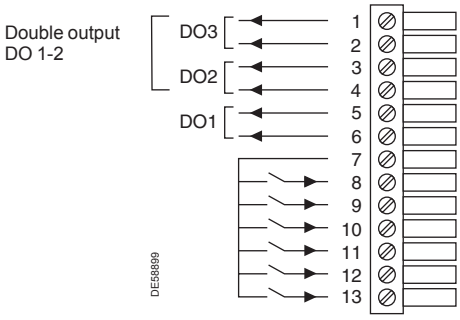
Note: Terminals 3 and 4 should not be connected. These terminals are not used.

Connection of digital inputs/outputs

- 6 inputs and 3 outputs are available for acquisition and control of digital information (door alarm, etc.)
- Insert the cable via the corresponding cable gland on the base of the enclosure.
- Connect the cable to the screw terminals provided for the purpose (see diagram opposite and page 6).

Input specifications

- Dry loop (internal polarization at 5 V)
- Non-insulated (protection by transil)
- Frequency for counting: up to 5 Hz
- Capability for declaring an FPI type input (in this case, the external lamp will flash when the input is activated. To be used when the fault detector is external and when the Flair 200C acts merely as a simple data transmission device).



Output specifications

- Dry contact insulated at 1.5 kV rms to the earth. No insulation between outputs
- Limit load: 30 VA / limited to 60 Vdc or 125 Vac.

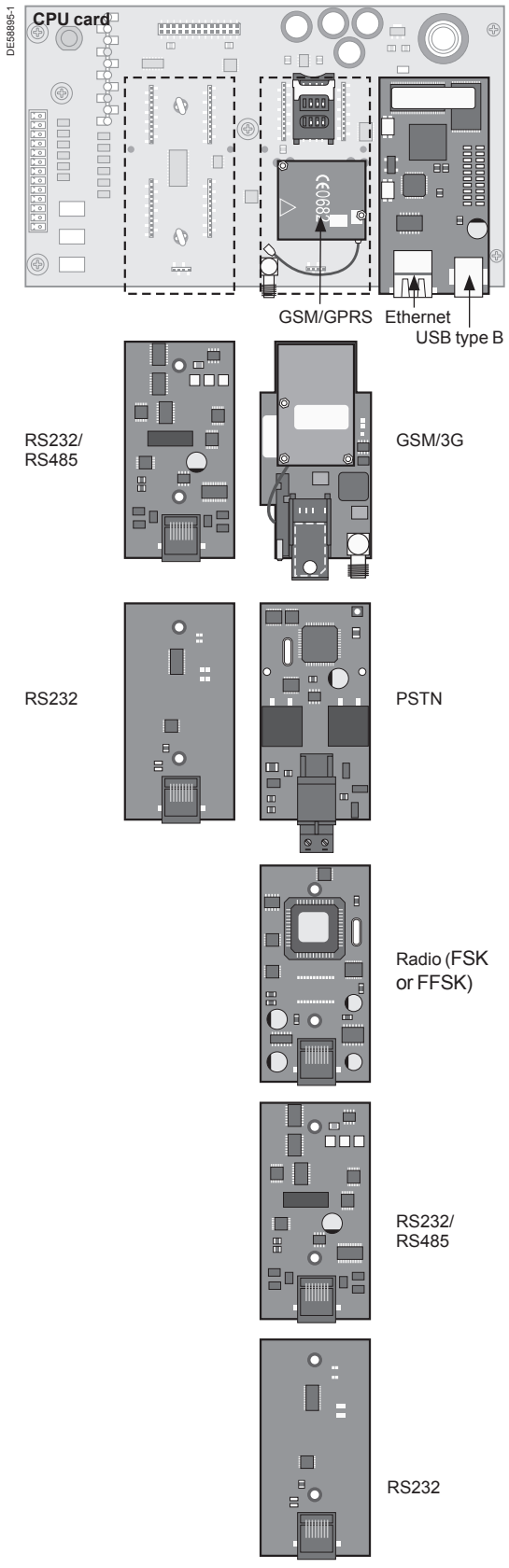
Capability for declaring the type of output:

- Pulse: in this case, the fact of activating an output will generate a pulse during a configurable activation period.

To be used when the fault detector is external and when the Flair 200C acts merely as a simple data transmission device. The output will be used to reinitialize the detector.

- Double: 2 digital outputs are used. This option offers a cheap solution to open/close some switches thanks to double-bits commands (requires the use of a power relay outside the Flair 200C).

Transmission equipment
Choice of equipment



The Flair 200C offers various types of communications via add-on cards which are connected to the CPU card.
The Flair 200C can receive up to 3 add-on cards depending on the options selected.

Standard equipment

Card on right-hand slot

■ A type B USB port.
This is used with a local PC for maintenance and parameters setup.

Optional equipment

Card on right-hand slot

■ An Ethernet port used for:
□ communication with the remote supervision centre via the IEC 60870-5-104, DNP3 IP or Modbus IP protocols
□ communication with Modbus TCP slaves (PLCs, protection relays…).
In that case, the Flair 200C plays the role of hub
□ maintenance and parameters setup from a local PC.

The Ethernet port is located on the card of the USB port.

Card on centre slot

A modem for remote communication with the remote supervision centre:

■ GSM/GPRS: quad band 850/900/1800/1900 MHz version
Note: the GSM/GPRS modem is integrated in the CPU card. Unlike other modems, this one is not interchangeable

■ GSM/3G: GSM/GPRS/EDGE: quad band, 850/900/1800/1900 MHz
UMTS/HSPA+: five band, 800/850/AWS/1900/2100 MHz

■ PSTN insulated at 8 kV rms (300 to 14400 bits/s - V32 bis)

■ Radio (FSK 600/1200 baud or FFSK 1200/2400 baud)
(radio not supplied with the product)

■ RS232/RS485 insulated at 2 kV rms

■ RS232 non-insulated.

Card on left-hand slot

A port allows communication in Modbus protocol with Sepam type local devices.
In that case the Flair 200C plays the role of hub.

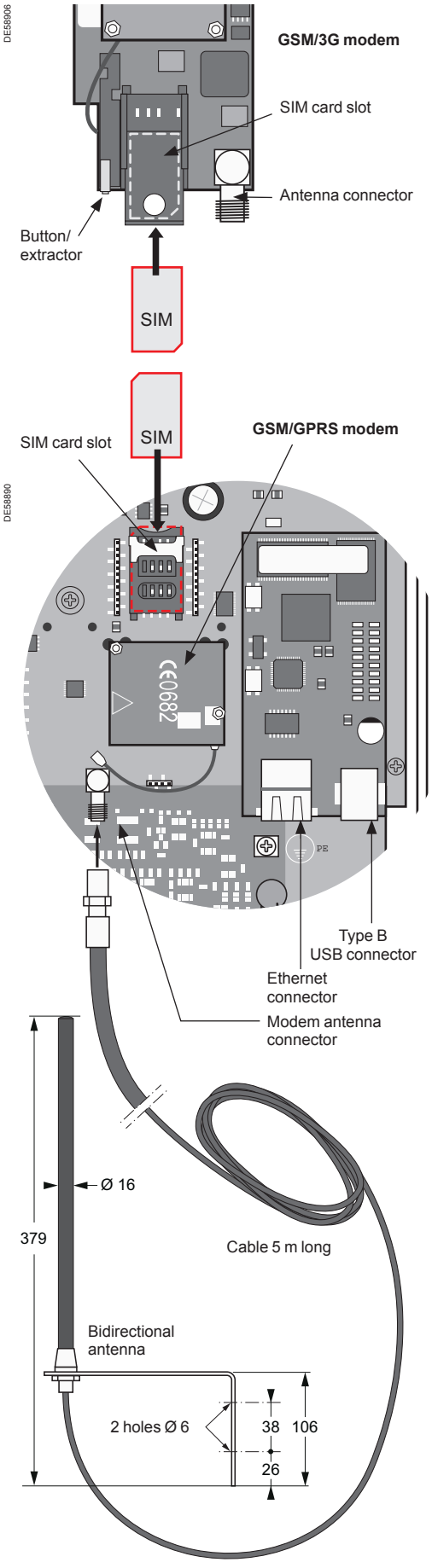
■ RS232/RS485 insulated at 2 kV rms.

■ RS232 non-insulated.

Communication protocols

All communication protocols can be used with the remote supervision centre:
■ IEC 870-5-101, IEC 870-5-104
■ DNP3, DNP3/IP
■ Modbus, Modbus/IP
■ Other protocols on request.

Transmission equipment
Connections



⚠ All servicing on the Flair 200C is performed with the power off.

All the installed connectors and equipment are accessible on the CPU card by opening the cover of the Flair 200C.

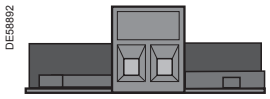
USB connector
Requires a USB-A/USB-B cable for communication with a local PC for consultation/ configuration.

Ethernet connector
Requires a “cross” or “straight” Ethernet cable depending on the type of connection (see “*Server connection*” chapter).

Operating start-up of a GSM/GPRS or GSM/3G modem (internal)
The antenna connector and the SIM card slot are located alongside the modem (see drawing opposite).

- ■ Attach the antenna to the wall of the substation (preferably outside)
- ■ Connect the antenna cable to the modem antenna connector
- ■ Insert the SIM card (see drawing opposite)
- □ **GSM/3G**
- - unlock the SIM card holder by pushing the button/extractor as far as it will go
- - remove the holder and insert the SIM card (cut-off corner at the bottom right)
- - replace the holder by pushing it fully into place.
- □ **GSM/GPRS**
- - unlock the SIM card slot shutter by pushing the metallic part downward
- - raise the shutter and slide the SIM card (cut-off corner at the top left) inside this shutter, under the metallic part
- - close again and relock the SIM card slot shutter.

Connection of a PSTN line
Connect the PSTN line to the 2 terminals provided for the purpose.

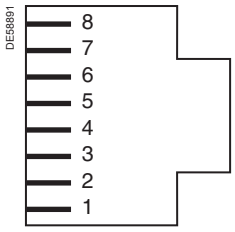


Connector on PSTN card

RS485 or RS422 connection to supervisor
Connect the RS485 or RS422 line in accordance with the diagram of the RJ45 type connector opposite.

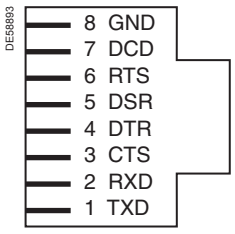
RS485 2-wire connection
1, 2, 3, 6, 7: Not used
4 : A
5 : B
8 : GND

RS422 connection
1 : Rx (B)
2 : Rx (A)
3, 6, 7: Not Connected
4 : Tx (A)
5 : Tx (B)
8 : GND



Modem end connector

RS232 connection to supervisor
Connect the RS232 line in accordance with the diagram of the RJ45 type connector opposite.



Modem end connector

Connection to local Modbus network
The RS232 and RS485 communication ports with Modbus protocol can communicate with local Modbus devices (e.g. Sepam type).
In that case the Flair 200C plays the role of hub.
Connection is identical to the RS232, RS485 and RS422 type connections described in detail above.
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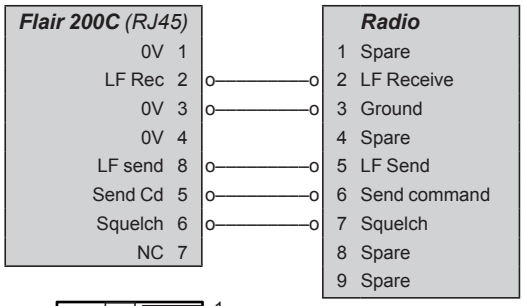
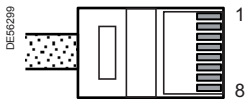
Transmission equipment
Connections

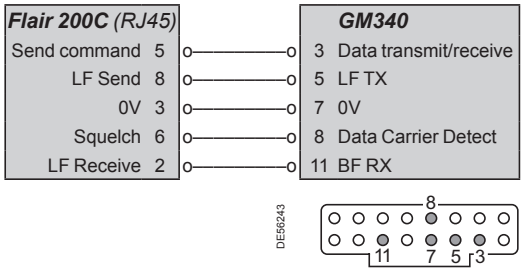
Connecting to an analogue radio transceiver
(accessible on the RJ45 connector of the internal modem radio card)





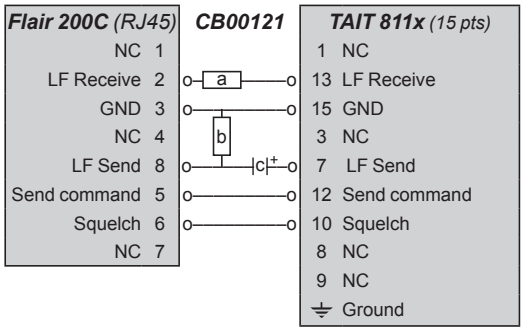
RJ45 connector on radio connection cable

Example of connection with a Motorola GM340 analogue radio



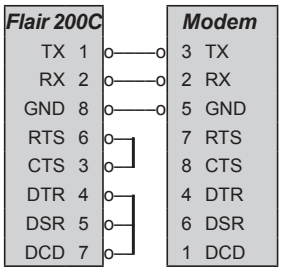
GM340 radio connector
Cable end view

Example of connection with a TAIT 811x analogue radio
(cord prewired in factory: CB00121)

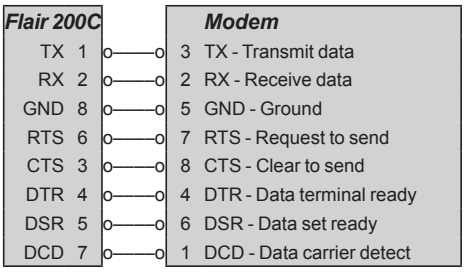


a = resistor 1/4W 5% 2.2 kΩ
b = resistor 1/4W 5% 820 Ω
c = electrolytic capacitor 4.7 µF/63 V
NC = Not Connected.

Connection of RS232 external modem (PSTN, radio modem, GSM, etc.)
(accessible on RJ45 8-pin connector located on the RS232 card)

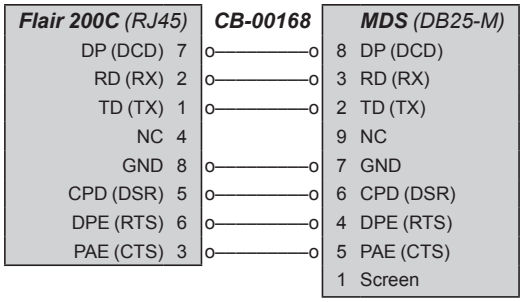


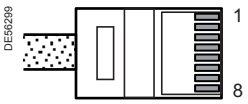
No CTS, DCD, DSR management



CTS, DCD, DSR management

Example of connection with an MDS 4710 digital radio
(cord prewired in factory: CB-00168)





RJ45 connector
on CB-00168 cable

Enclosure power supply

⚠ **To prevent any risk of electric shock or burns, check that the mains supply is disconnected before carrying out any work on the product.**

Earthing

⚠ **The equipment must be earthed to ensure personnel safety.**
A screw-on terminal block is provided for this purpose on the Flair 200C card.
Use an earth cable of cross section greater than or equal to 4 mm^2, U1000RO2V or equivalent.

Connecting an AC supply

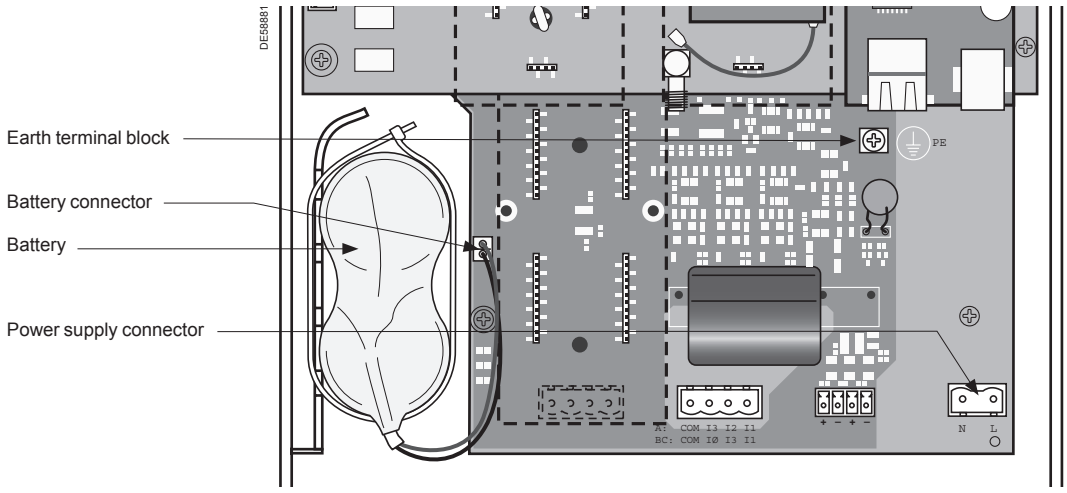
⚠ **To prevent any risk of electric shock or burns, check that the mains supply is disconnected before carrying out any work on the enclosure.**

- Insert the "AC supply" cable (2 x 2.5 mm^2) into the appropriate cable gland and connect it using the shortest possible length of cable to the screw terminals provided for the purpose
- Input span: 120/240 Vac –20%/+10% - 50/60 Hz
- Connect one phase cable to the "L" terminal and the neutral cable to the "N" terminal
- The AC power supply must come from downstream of an HRC (high rupture capacity) fuse.

⚠ **IMPORTANT NOTE: the "AC supply" input is insulated at 10 kV rms relative to the enclosure ground. It is important to ensure that the cable and its use outside and inside the product do not damage this insulation.**

Installing the battery

The battery is of 4 V - 2.5 Ah type. It is housed in the left-hand part of the enclosure (see drawing below). Connect the battery to the connector provided for the purpose.



Server connection

Principle of the Flair 200C embedded Web server

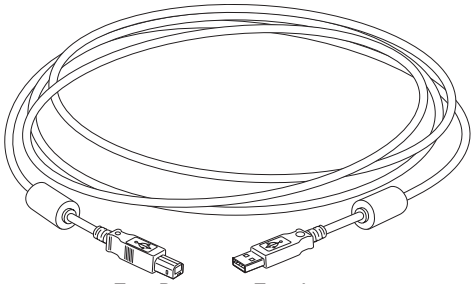
The Flair 200C includes an embedded Web server which is initialized automatically as soon as connection is established with the Flair 200C.
The data displayed by the Flair 200C via this embedded server appears in the form of HTML pages.
Various pages and sub-pages can be accessed by the user depending on the rights available to him. The HTML pages are refreshed in real time every seconds so as to update the states reported by the Flair 200C.
Access and connection are secured by a Login and password. Several levels of access to the HTML pages can be configured, provided one have the required rights.

From the embedded server, it is possible to:

- Configure the fault detector, communications and system parameters (management of variables, classes, rights, etc.)
- View the states managed by the Flair 200C (TSS, TSD, routine faults, telemeasurements, etc.)
- Save or load the Flair 200C parameter configuration from files already backed up on the PC
- Transfer diagnostic logs in the form of Excel-compatible files
- Load a new software version of the Flair 200C application.

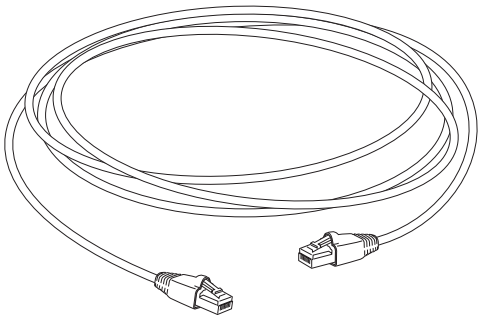
The embedded server can be accessed both via the USB port and via the Ethernet port. There is no difference in operation according to the type of port used.

DE55672



USB cable

DE55673



"Cross-over" or "straight-through" Ethernet cable depending on type of link access

Equipment required for Flair 200C/PC connection

- A microcomputer operating under Windows 2000 or XP or Seven and including *Internet Explorer* (version 5.5, 6.0, 7, 8 or 9).
- An USB port on this PC to perform connection with the Flair 200C.
- An Ethernet port (optional) is available on the Flair 200C for access to an Ethernet network. This port can also be used for direct connection of the Flair 200C with the PC.

The Ethernet cable required for connection of the Flair 200C or PC to the Ethernet network is of the "straight-through" type.

The Ethernet cable required for direct connection of the PC with the Flair 200C is of the "cross-over" type.
The USB cable required for connection of the PC with the Flair 200C is of the USB-A type at one end and USB-B at the other.

A CD-Rom is supplied to the user for:

- Installation of the USB driver for connection with the Flair 200C.
- Installation of *Java Runtime Environment* (version 5.0 or higher) needed for port trace operation (Supervisor-Flair 200C frame analysis).

⚠ **NB:** TCP/IP ports 1168 and 1170 must be accessible on the PC for trace operation. Contact the network administrator if it is necessary to alter the PC or network configuration to deactivate the firewall on these ports.
Configuration of the Flair 200C is performed directly from *Internet Explorer*.
No other additional software is needed to access the Flair 200C testing-maintenance configuration operations (apart from *Java Runtime*).

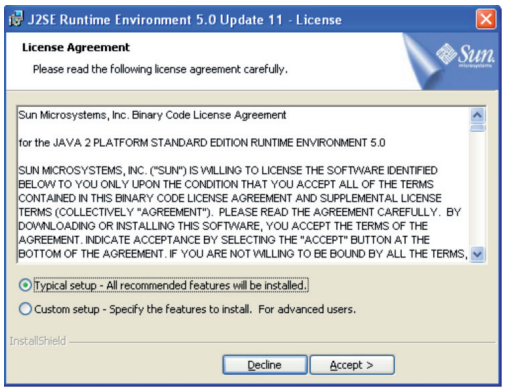
Initialization of connection

The Flair 200C incorporates by default IP addresses necessary for local connection from a PC. It is important to know these addresses in advance in order to start a connection:

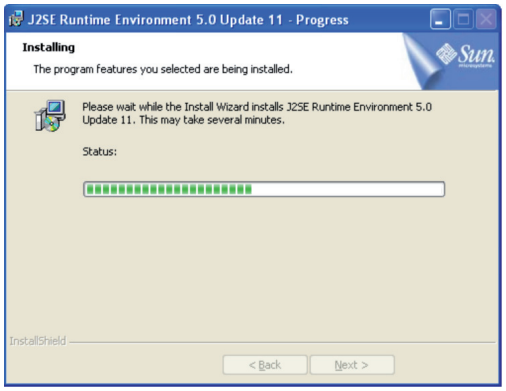
- USB port: default address on the Flair 200C = **212.1.1.10**
- Ethernet port: default address on the Flair 200C = **172.16.0.5**

Note: the USB address cannot be modified by the user. The Ethernet address, on the other hand, can be modified (if the rights so permit) so as to correspond to the local area network, which does not necessarily use the same network addresses and masks.
For the Flair 200C link via Ethernet, steps 2 and 3 are not necessary. In that case, go directly to step 4.

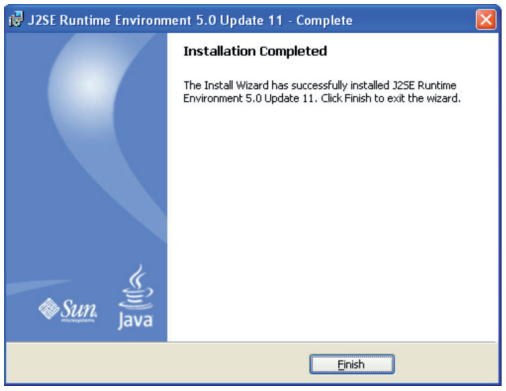
PE57411EN



PE57413EN



PE57414EN

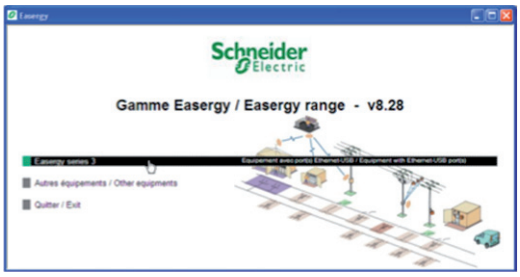


Step 1 - Installing Java Runtime Environment 5.0

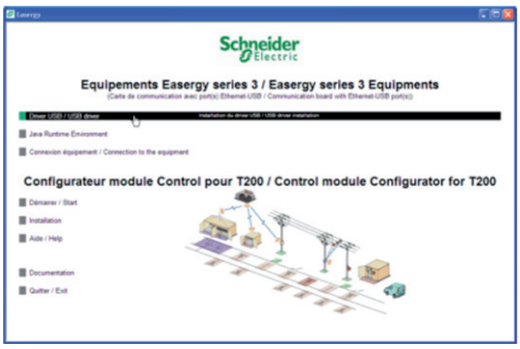
- Insert the CD-ROM supplied with the Flair 200C into the PC drive, then double-click on the *"jre-1_5_0_11-windows-i586-p-s.exe"* installation file located on the CD-Rom (in the *"D:\Tools\Java"* directory).
- Software installation begins; click on the *"Standard installation…"* option and then on *"Accept"*.
- Wait until installation is completed, then click on *"Terminate"*.

Initialization of connection (cont'd)

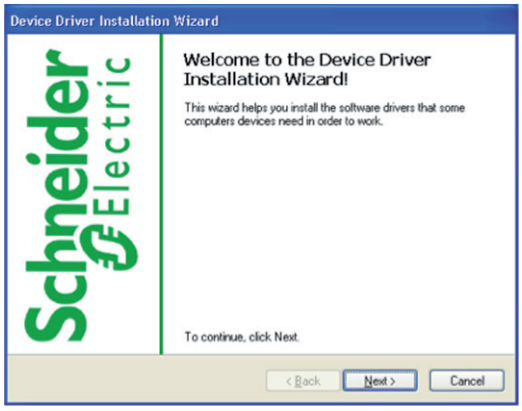
PE57586



PE57584



PE57585EN



PE57587EN

Step 2 - Installing the USB driver

Carry out the following operations to install the USB driver:

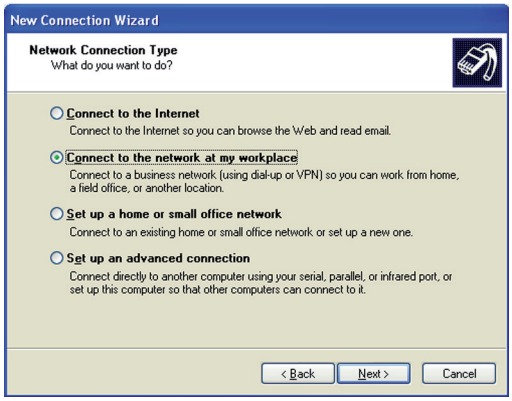
- Insert the Easergy CD-ROM supplied with the equipment into the PC drive.
- A *"Gamme Easergy / Easergy range – Vx.xx"* window should automatically appear on screen. If this is not the case, double-click on the "Autorun.hta" file located in the CD root directory.
- Click on the *"Easergy series 3"* link.
- In the *"Equipements Easergy series 3 / Easergy series 3 Equipments"* window which appears on screen, click on the *"USB Driver"* link.
- Choose the setup language, then click on *"OK"*
- Click on *"Next"* to start the *"InstallShield Wizard"* module
- Choose the installation directory (the directory proposed by default can be kept), then click on *"Next"*
- Then click on *"Install"* to start installation
- A driver setup window appears on screen; click on *"Next"*.
- Installation of the Easergy USB driver starts automatically.
- At the end of installation, when the window showing that the driver has been correctly installed appears on screen, click on the *"End"* button.
- The Easergy USB driver is installed.
- An *"Easergy USB connection"* start-up shortcut is also created automatically on the PC desktop (see step 4).

Important note : unlike the previous USB driver, this driver is installed for all the USB ports of the PC. This driver needs therefore be installed only once, irrespective of the USB port used. If a different USB port is used for a future connection, Windows will automatically detect and install the Easergy USB driver for this other USB port.

Note: step 2 is no longer necessary after the first connection performed with the Flair 200C. In that case, go directly to step 4.

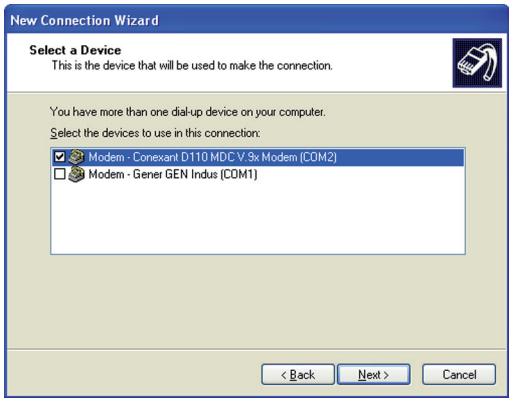
Initialization of connection (cont'd)

PE57500EN



PE57501EN

PE57502EN



PE57503EN

Step 3 - Creation of the PSTN or GSM remote network connection

This step is to be taken into account only if the Flair 200C includes a GSM or PSTN (telephone) internal modem.
Note: it is not necessary to create this type of connection for the GPRS link.

With Windows 2000

- Click on the Windows *"Start"* button
- Click on *"Settings"*
- Click on *"Network connection and remote access"*
- Click on *"Establish a new connection"*
- Click on *"Connection to a private network"*
- From the list of peripherals displayed, select that corresponding to the modem to be used for connection, by checking it
- Enter the phone number of the Flair 200C to be contacted (this number may be changed later, at each connection attempt)
- Select the option *"For all users"*
- Give a name to the telephone connection to the Flair 200C (e.g. "*Flair 200C telephone connection*")
- When the connection window is displayed on screen, there is no need to give a user name and login password, and if necessary change the phone number of the Flair 200C to be contacted
- Click on the *"Dial"* option.

The PSTN or GSM remote network connection between the PC and the Flair 200C is initialized between the two devices, then a modem connection status icon is inserted in the Windows toolbar.

With Windows XP

- Click on the Windows *"Start"* button.
- Click on *"Control Panel"*
- Click on *"Network connections"*
- Click on *"Create a new connection"*
- Click on *"Connection to the local area network"*
- Select the option *"Remote access connection"*
- From the list of peripherals displayed, select that corresponding to the modem to be used for telephone connection to the Flair 200C, by checking it
- Give a name to the telephone connection to the Flair 200C (e.g. "*Flair 200C telephone connection*")
- Enter the phone number of the Flair 200C to be contacted (this number may be changed later, at each connection attempt)
- Select the option *"Do not use my microprocessor card"*
- Select the option *"All users"*
- Click on *"Add a shortcut to this connection on my desktop"*, then on *"Terminate"*
- When the connection window is displayed on screen, there is no need to give a user name and login password, and if necessary change the phone number of the Flair 200C to be contacted
- Click on the *"Dial number"* option.

The PSTN or GSM remote network connection between the PC and the Flair 200C is initialized between the two devices, then a modem connection status icon is inserted in the Windows toolbar.

Note: step 3 is no longer necessary after the first connection performed with the Flair 200C. In that case, go directly to step 4.

Initialization of connection (cont'd)

PE57580

Step 4 - Starting connection with the Flair 200C

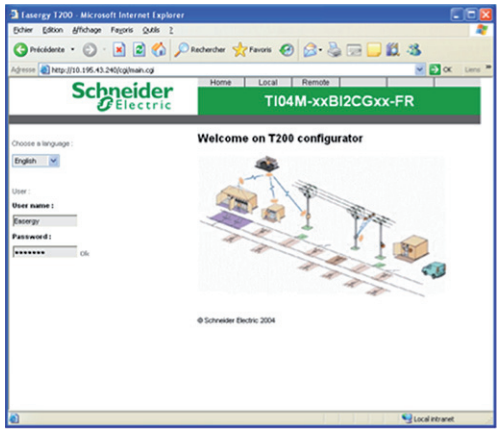
Local access via the USB port of the Flair 200C

- With the Flair 200C powered up without a "Fault" indicator lamp lit, connect the USB cable to one of the USB port of the PC and to the product
- Click on the "*Easergy USB connection*" shortcut already installed on the desktop of the PC to start the USB connection
- After few seconds, Internet explorer starts automatically and is connected to the default USB IP address *"212.1.1.10"*
- The connection to the unit is established automatically and the home page of the Web server appears on screen
- Enter the language to use, then click on *"OK"*
- Enter a *"User name"* and a *"Password"* (by default: *"Easergy", "Easergy"*) then click on *"OK"*Access to the HTML pages is activated according to the rights related to this user.

Access to the HTML pages is activated according to the rights related to this user.

Note : contrary to the old USB driver, to stop the USB connection, you just have to disconnect the USB cable. Windows will stop automatically the current USB connection.

PE57581EN



Local access via the Ethernet port of the Flair 200C

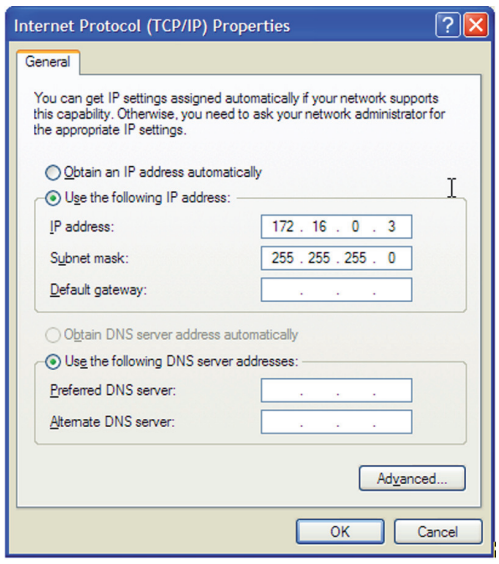
- In the Windows control panel, click with the right mouse button on *"Connection to local area network"* located in the *"Network Connections"* directory.
- Click on the *"Internet Protocol (TCP/IP)"* item, then on the *"Properties"* button.
- Then check the "Use the following IP address" option and then manually enter the following items:
  - IP address = 172.16.0.3
  - Sub-network mask = 255.255.255.0
- Click on the *"OK"* button to accept the settings
- Start *Internet Explorer*
- Enter the IP address (172.16.0.5) in the *"Address"* field, then click on *"OK"*

The home page of the embedded server appears on screen

- Define the language to be used
- Enter a *"User name"* and a "Password" (by default: *"Easergy", "Easergy"*), then click on *"OK"*

Access to the HTML pages is activated according to the rights related to this user.

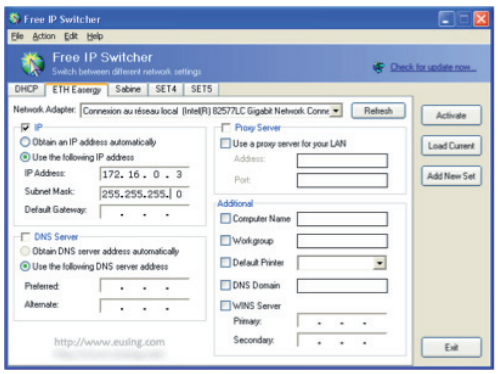
PE57504EN



⚠ **IMPORTANT NOTE:** once connection with the Flair 200C is completed, you should restore the original IP address configuration settings of the PC.

Note : there are useful utilities that can change automatically the TCP/IP address of the PC. We recommend the software "Free IP Switcher" that can be downloaded as a freeware on internet.

PE57582



Initialization of connection (cont'd)

Remote access via a local Ethernet network (LAN) or a GPRS or 3G network

■ With the Flair 200C powered up, connect the PC and the Flair 200C to the local Ethernet network (LAN) using appropriate cables (straight Ethernet cables)

■ Start *Internet Explorer*

■ Enter the IP address of the Flair 200C corresponding to the Ethernet or GPRS/3G access in the *"Address"* field, then click on *"OK"*

The home page of the embedded server appears on screen

■ Define the language to be used

■ Enter a *"User name"* and a *"Password"* (by default: *"Easergy", "Easergy"*), then click on *"OK"*

Access to the HTML pages is then activated according to the rights related to this user.

Note 1: generally, the default IP address of the Flair 200C cannot be used on the Ethernet network,3G or GPRS employed, and it must therefore be replaced, in the Flair 200C's specific IP address configuration page, with an address acceptable for the network (see section on "IP address configuration").

Note 2: unlike the Ethernet port, the connection speed on a GPRS or 3G link is relatively slow (max. theoretical connection speed for GPRS = 50 kbit/s, 3G = 2 Mbit/s). Accordingly, so that the display of data on screen may be slowed as little as possible, following a GPRS or 3G connection the Flair 200C automatically displays the pages of the Web server in simplified mode (Web server configuration in *"Remote"* mode). However, it is possible to return to a standard display by clicking on *"Local"* configuration, at the top of the Web server home page.

Remote access via telephone or GSM link

This access operates only when the Flair 200C includes a GSM or PSTN (telephone) internal modem.
When an external modem is used, it is possible that this access may operate, but that depends on the modem used.

■ Start the GSM-PSTN remote network connection created previously (➡ step 3)

■ Click on *"Dial number"* to start remote network connection

■ Once connection is established, start *Internet Explorer*

■ Enter address 212.1.0.1.

The home page of the embedded server then appears on screen

■ Define the language to be used

■ Enter a *"User name"* and a *"Password"* (by default: *"Easergy", "Easergy"*), then click on *"OK"*.

Access to the HTML pages is activated according to the rights related to this user.

Note: unlike a standard USB or Ethernet port, the connection speed on a telephone link or GSM is rather slow (9600 baud).
Accordingly, so that the display of data on screen may be slowed as little as possible, following a PSTN or GSM connection the Flair 200C automatically displays the pages of the Web server in simplified mode (Web server configuration in *"Remote"* mode). However, it is possible to return to a standard display by clicking on *"Local"* configuration, at the top of the Web server home page.

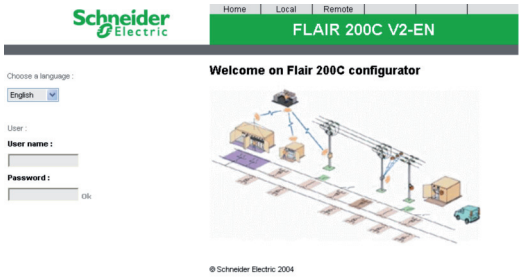
Description of the server

Overview of the Flair 200C embedded Web server

Once access to the on-board server has been identified by user name and password, all the HTML pages can be consulted by simply clicking on the tabs or the associated drop-down lists when they are available:

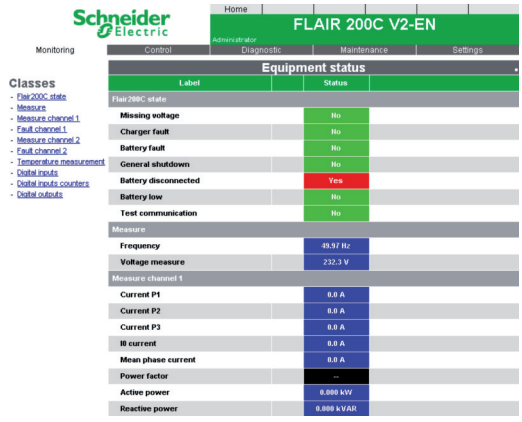
Details of the settings for each page are given in Appendix A.

PE57505EN



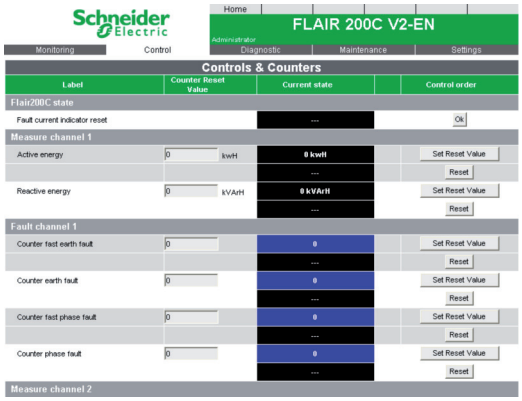
Home Page

PE57506EN



Monitoring Page

PE57507EN



Control Page

Home Page

This page is displayed upon connection to the Flair 200C. It enables definition of the language to be used for displaying the pages. It also allows definition of user access rights by login and password.
The users and passwords that can be accessed depend on the configuration defined in the **User** page of the **Maintenance** menu.

By default, the *"Easergy"* user and *"Easergy"* password allow access to the embedded server as *"Administrator"*.

A wrong user or password automatically opens access in *"Monitoring"* mode.

A click on the *"Remote"* button at the top of the page allows you to log on to the Flair 200C Web server with a simplified display of information (without images or logos) so as to optimize data transfer times.
This mode is used automatically for slow remote network connections (PSTN or GSM at 9.6 kbits/s).

A click on the *"Local"* button at the top of the page allows you to log on to the Flair 200C Web server with a normal display (all logos and images are transferred and displayed). This mode is used automatically for high-speed local area connections: USB (115.2 kbits/s) or Ethernet (100 Mbits/s).

Monitoring Page

This page can be used to consult the Flair 200C states:
- TSS: status of logical inputs, Flair 200C internal faults, voltage presences, current faults, etc.
- TSD: state of the double bit digital outputs. state of the switch, etc.
- TM: current, voltage, frequency measurements, etc.
- CNT: counter: energy, etc.
- TCL: single bit command: opening/closing of digital outputs.
- TCD: double bit command: Reset command for external fault detector.

The page is displayed by class (e.g. *equipment, equipment measurement, etc.*). Each class covers a category of information so as to facilitate monitoring on screen.

The states of the indications or measurements are refreshed automatically.

Control Page

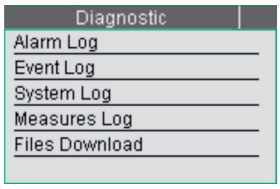
This page allows local control orders to be sent from the PC to:
- logical output control
- counter presetting
- reset of the fault detection.

The status of the control order is refreshed on screen automatically as soon as it is completed.

Note: the colours of the states displayed can be modified by configuration.

Description of the server (cont'd)

PE57511EN



Drop-down list – Diagnostic menu

Diagnostic Menu

This menu allows consultation of the logs recorded in real time by the Flair 200C. The event time stamping is 1 ms.

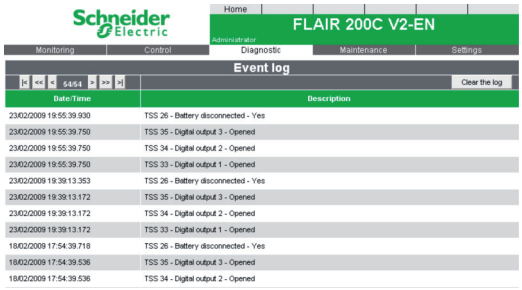
Each log allows consultation of the history of states occurring on the Flair 200C with a description of the states.
All the information present in the logs is time-and-date stamped by the Flair 200C's internal clock.

The logs are as follows:

■ **Alarm log** (storage capacity: 2000)
Alarms can be generated and transmitted spontaneously to the control centre after an information change of status, provided that this status has been configured as alarmed.
A box associated with each alarm is checked when the control centre has acknowledged that alarm.

Note: information configured as alarmed automatically implies the generation of an associated event (in the event or measures log depending on the type).

PE57508EN

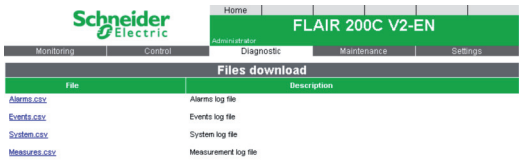


■ **Event log** (storage capacity: 10000)
Every change of status generates an event, provided that the use of events for this status has been configured.

■ **System log** (storage capacity: 6000)
The equipment also incorporates a function for recording additional information to facilitate operation and maintenance:
□ storage of transmission events (to determine the origin of a recurring communication fault)
□ indication of transmission errors (CRC error, collisions, PSTN line out of order, switchover to redundancy, etc.)
□ indication of system events (Flair 200C start-up, change of configuration, etc.).

■ **Measures log** (storage capacity: 30000)
The measurements managed by the Flair 200C (phase current, mains voltage, etc.) can be saved in a log, provided that their use has been configured.
The measurements can be recorded in several ways:
□ periodically (sampled or averaged value with configurable period)
□ upon exceeding a threshold (configurable high or low threshold)
□ upon variation or "dead band" (configurable variation %)
□ upon periodic recording of Min. and Max. values (configurable values and period).

PE57509EN



File transfer – Diagnostic menu

For all the logs, when the maximum storage capacity is reached, the most recent event occurring erases the oldest event on the list.

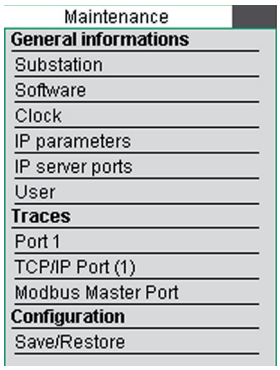
A File Transfer sub-menu allows these logs to be saved to the PC in the form of Excel-compatible files (.csv files).
These files can be consulted or transferred, to enable the establishment of statistics or reviews.

An *"Empty log"* button in each log can be used to empty their content, i.e. to erase all the information saved previously.

Principle of saving to logs
To increase the life of the flash memory, saving to the logs is performed every 5 min. Accordingly, when a reset is performed on the Flair 200C, it is possible that the most recent events that have occurred since the last backup may not be saved in the logs. The only exception is when a power cut is imminent on the enclosure. In that case, even if the time elapsed is less than 5 min., the Flair 200C saves the events to the logs before cutting off the power supply.

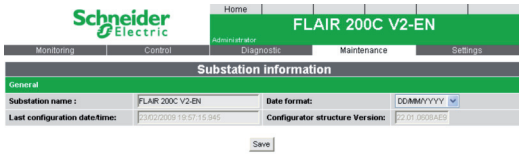
Description of the server (cont'd)

PE57801EN



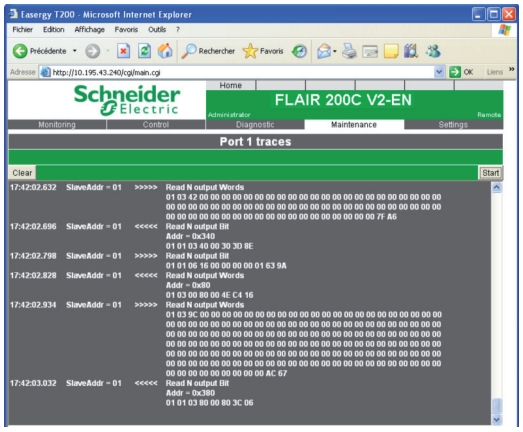
Drop-down list – Maintenance menu

PE57513EN



Substation information – Maintenance menu

PE57514EN



Port trace – Maintenance menu

Maintenance Menu

Several pages facilitate Flair 200C maintenance.
They provide information or allow configuration of the Flair 200C application.

1 – General information

Specific pages provide information concerning the Flair 200C application, namely:

■ **Substation page:** information concerning the current application (date and time of last configuration, name of substation, etc.).

■ **Software page:** information concerning the software used by the Flair 200C (version, date and time of compilation, size and CRC32).
The Flair 200C is capable of storing two different software versions in memory.
It is possible to switch from one software version to another by mere selection (if two versions are available).
It is also possible to load a new software version from a file available on the PC or from a floppy disk or CD-Rom.
Note: when loading software on the Flair 200C, one in fact loads the protocol used for transmission.

■ **Clock page:** allows the Flair 200C date and time to be configured manually or automatically from the time on the PC.
A click on the "Update" button causes the manual change of date and time to be accepted.
A click on the "Synchronization" button allows the PC date and time to be taken into account automatically for configuration on the Flair 200C.
This menu can also be used to adjust the time zone and configure time synchronization by SNTP (see Appendix A).

■ **IP parameters page:** allows consultation or where applicable configuration of the Ethernet and USB interface parameters (IP addresses, sub-network masks, etc.).
When a GPRS or 3G modem is installed, this page also allows consultation of the IP addresses assigned automatically by the GPRS/3G server.
⚠ **NB:** it is dangerous to modify the Ethernet IP parameters, with a risk of no longer being able to access the Flair 200C. Call on competent authorities to modify these parameters.

■ **IP server ports page:** allows redefinition of the port numbers used by the Flair 200C for IP access, in the event that the transmission network does not accept the default numbers (e.g. restriction on certain GPRS/3G operators).
By default, the following port numbers are configured on the Flair 200C:
□ HTTP server port = 80
□ Telnet server port = 23
□ Port 1 trace server port = 1168
□ TCP/IP port trace server port = 1170
⚠ **NB:** if the HTTP port number is changed in this page, to be able to log on to the Flair 200C Web server again, it is essential to add the port number at the end of the Flair 200C's IP address preceded by a colon (e.g. **10.207.154.239:1500** for Flair 200C access on port 1500).

■ **User page:** allows creation, modification or deletion of users and management of rights (login, password, access rights).

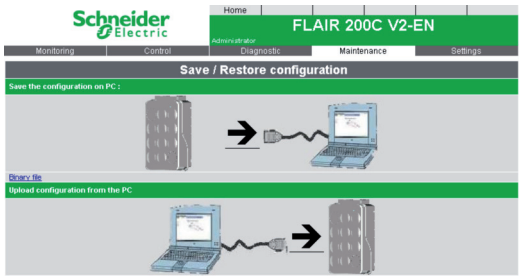
2 – Traces

■ **Port 1 or TCP/IP page:** these pages allow monitoring of communication exchanges between the control centre and the Flair 200C, for each port available (hexadecimal frames).
This trace is displayed on screen in decoded form to facilitate reading of the frame's content:
□ column 1: frame time-and-date stamping (in hour:minute:second.thousandth of second format
□ column 2: direction of dialogue, RTU ➡ PC or PC ➡ RTU with associated address numbers of the PC and RTU
□ column 3: hexadecimal frame + brief description of the content of the frame.

■ **Page Modbus master port:** this page allows monitoring of communication exchanges between the Flair 200C and Modbus/Modbus TCP slaves.
For more information concerning the communication with Modbus slaves, refer to the User Manual ref NT00121-xx.

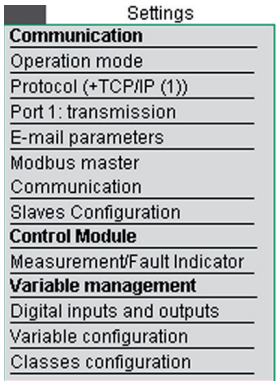
Description of the server (cont'd)

PE57510EN



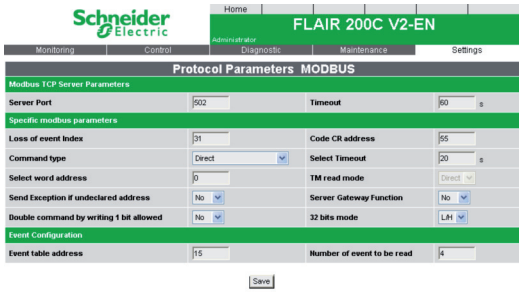
Saving/backup – Maintenance menu

PE57802EN

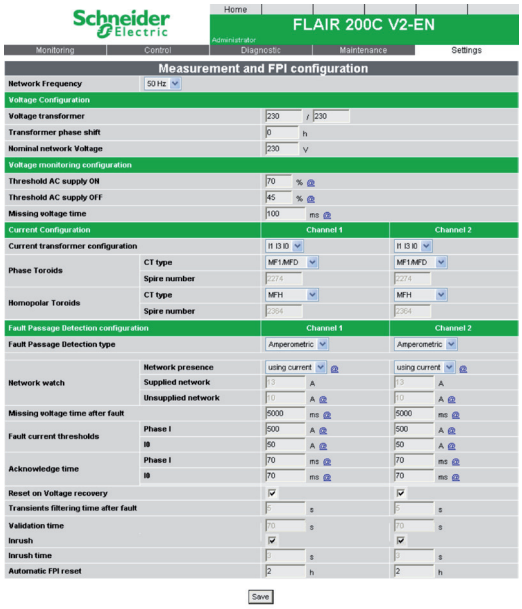


Drop-down list – Settings menu

PE57516EN



PE57517EN



3 – Configuration

■ **Save/Restore page:** allows all the current Flair 200C configuration parameters to be saved to a file.
It is also possible to load from a file available on your PC or from a floppy disk or CD-Rom the Flair 200C configuration parameters coming from a preceding backup or coming from another substation.
This file can be used to configure one or more other substations in the same way without being obliged to reconfigure all the parameters one by one.
Note: during loading from a file, data integrity is verified automatically so as to ensure the compatibility of application versions.

Settings menu

Configuration of the Flair 200C is performed from pages grouped together in several different categories:

1 – Communication

Several pages allow you to configure the specific communication parameters of the Flair 200C:

■ **Operation Mode page:** it is possible to determine:
□ the protocol available
□ the type of transmission medium to be used (Radio, PSTN, GSM, etc.)
□ the way in which the ports will be managed according to one of the available modes:
- not used
- normal
- test.

■ **Protocol and TCP/IP Protocol pages:** these pages are used to configure the parameters specific to the protocol used:
□ max. number of send operations
□ collision avoidance system
□ configuration of link addresses
□ frame size
□ etc.
Note: each type of protocol has its specific configuration page.
For more details, refer to the specific user manual for the protocol installed on the Flair 200C.

■ **Page Port 1 transmission:** this page is used to configure the parameters of the communication port (modem):
□ baud rate (e.g. 19200 baud)
□ parity, stop bit, etc.
□ time-out management (e.g. RTS-CTS, CTS-message, etc.)
□ etc.
Note: the parameters displayed in this page depend on the type of transmission medium configured in the Operation Mode page.

■ **E-mail parameters page:** in an event of alarm or periodically, an e-mail can be sent. The e-mail gives the state of a specific variable in the substation.
This page makes it possible to set up the following parameters:
□ e-mail of the recipient(s)
□ SMTP parameters
□ …
Note: in order to send e-mails, it is necessary to have an Ethernet port, or to have a GSM or GPRS modem.

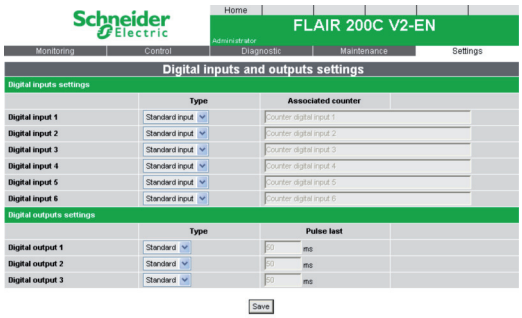
■ **Modbus Master and Slaves configuration page:** these 2 menus allow configuration of communication with Modbus/Modbus TCP slaves.
The settings of the communication with Modbus/Modbus TCP slaves is described in the documentation NT00121-xx.

2 – Control module

■ **Measurements/Fault Detector Page:** this page can be used to configure all information relating to fault detection and measurement, namely:
□ frequency configuration
□ measurement and voltage monitoring configuration
□ current measurement configuration
□ fault detection configuration.

Description of the server (cont'd)

PE57518EN

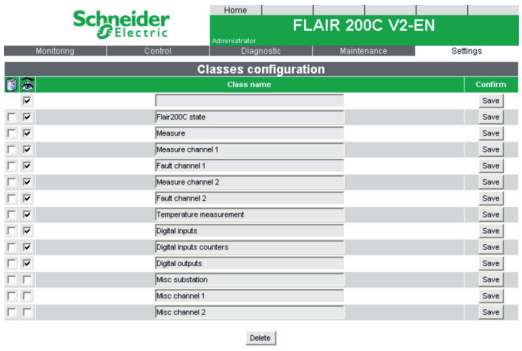


Digital I/O configuration – Settings menu

PE57519EN

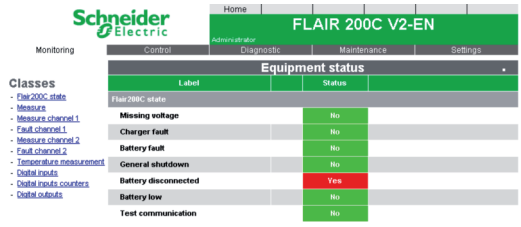
Variable configuration – Settings menu

PE57520EN



Classes configuration – Settings menu

PE57521EN



Example of variables associated with a class
Excerpted from the "Monitoring" page

3 – Variable management

All the information managed by the Flair 200C must be configured separately to define its operation and how it will be managed by the embedded server:

■ **Digital Inputs/Outputs page:** these pages allow configuration of settings for logical inputs/outputs. Each input can be declared as standard or FPI type.
Each output can be declared as standard, pulse or double type.

■ **Variable Configuration page:** the complete list of information (variables) managed by the Flair 200C is displayed in this page, under various categories.

Depending on the type of variable, the configuration page and the settings displayed may be different. There is a specific type of page for:
□ double bit commands (e.g. TCD)
□ single bit commands (e.g. TCL)
□ single indications (e.g. TSS)
□ double bit indications (e.g. TSD)
□ analogue measurements (e.g. TM)
□ counters (e.g. CNT).

The parameters to be configured for each variable are (for example):
□ variable name
□ type of access (operator session, administrator session, etc.);
□ assignment class
□ logical, remote and internal addresses
□ measurement, event and alarm management
□ type of recording for measurements (periodic, upon exceeding high or low threshold, upon % variation or indication of min. and max. values per period)
□ etc.

Note: the parameters to be configured depend on the type of page displayed.

■ **Classes Configuration page:** the variables created can be grouped together by classes, so as to facilitate the management and display of variables.
Each variable can be assigned to one of these classes by configuration.
This page can be used to create, modify or delete the classes managed by the embedded server and determine those that will be visible in the *Monitoring* page.

■ **Modbus master communication and Slaves configuration pages:**
consult the user's manual NT00121-xx.

■ **Embedded PLC and Formulas and Peer to Peer pages:**
consult the user's manual NT00320-xx.

Flair 200C settings

This chapter aims to provide the user with all the information needed to be able to perform configuration of the Flair 200C settings.

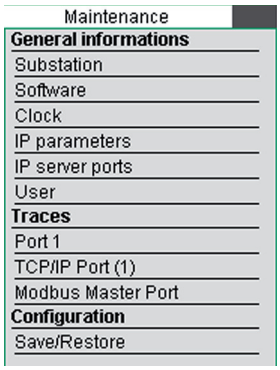
Certain complex functions of the Flair 200C, in particular, require some detailed explanations (fault detection, etc.) for a better understanding of how to configure the Flair 200C settings.

The functions discussed in this chapter are as follows:

- Comment area
- Configuration of Ethernet interfaces
- Save/Restore configuration parameters
- Parameters for communication with the supervisor
- E-mail parameters
- Parameters of the measurement and fault detection module
- Logical input/output parameters
- Variable configuration
- Classes configuration.

Flair 200C settings
Comment area

PE57801EN

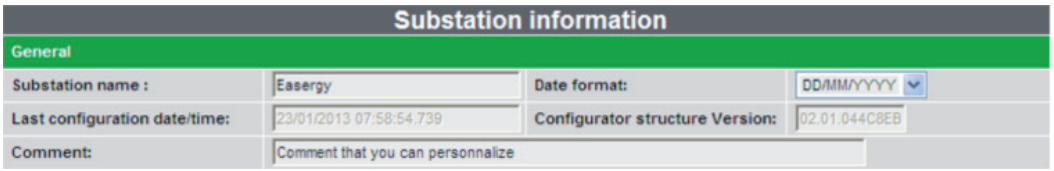


Comment area

Access: ***Maintenance*** ➞ ***Substation*** menu

The user can fill in an additional free 50-character comments area, in the *"Maintenance/Substation"* page of the Flair 200C's embedded Web server.

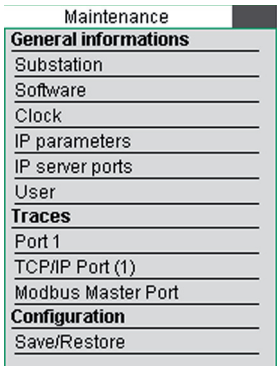
No special processing is performed on these comments. It is simply a text to give the user explanations on the equipment or the associated MV/LV substation.



PE57588EN

Flair 200C settings
Ethernet interface

PE57801EN

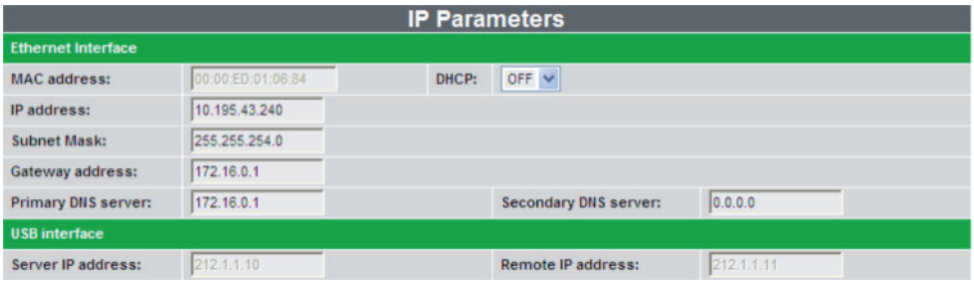


Configuration of Ethernet interfaces

Access: ***Maintenance*** → ***IP Parameters*** menu

This page can be used to configure the Ethernet connection parameters of the Flair 200C.

PE57589EN



Ethernet interface

■ **MAC address:** Unique identification address for each Flair 200C, set in factory. (Consultation exclusively)

■ **DHCP:** Defines whether the router of the Ethernet local area network can allocate a new IP address to the Flair 200C automatically upon a new connection. It is recommended not to activate this function or else you could no longer be able to log on to the Flair 200C if the modified address is not known.

■ **IP address:** Base IP address of the Flair 200C (as standard: 172.16.0.5).

■ **Sub-network mask:** The mask defines the possibility of configuration of the IP address on the Ethernet network. For each IP address field, (0) means authorization of 255 values and (255) means fixed value for this field.(As standard: 255.255.255.0)

■ **Gateway addresses:** IP address of the server's Ethernet gateway. The gateway centralizes all the network IP accesses (as standard: 172.16.0.1).

■ **Primary DNS server:** IP address of the primary DNS server (Domain Name Server). The DNS enables the IP addresses to be associated with the website names (as standard: 172.16.0.1).

■ **Secondary DNS server:** IP address of the secondary DNS server (Domain Name Server). Backup DNS server (as standard: 0.0.0.0).

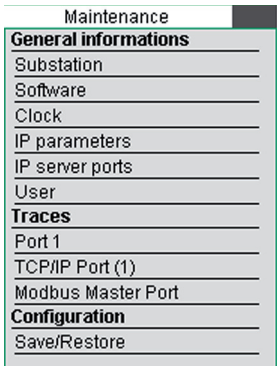
USB interface

■ **Server IP address:** IP address of the Flair 200C's embedded Web server for USB access. Unmodifiable (as standard: 212.1.1.10).

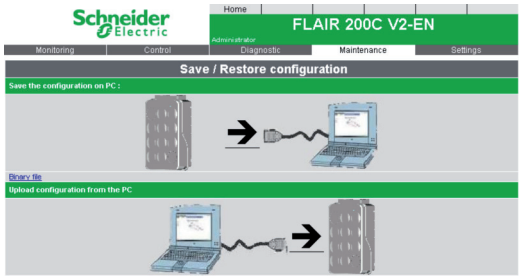
■ **Client IP address:** IP address assigned to the PC connected via USB to the embedded Web server. Unmodifiable (As standard: 212.1.1.11).

Flair 200C settings
Save/Restore configuration parameters

PE57801EN



PE57510EN



Save/Restore Page

Access: ***Maintenance*** ➡ ***Save/Restore*** menu

The Flair 200C can save in file form all the configurable parameters of the equipment (except the parameters of the *"IP parameters"* page which remain specific to each equipment item).

This file can then be used for downloading to other equipment of the same type, thus enabling the Flair 200C to be configured automatically without needing to redo the entire configuration manually, which would be rather onerous.

However, the parameters specific to each Flair 200C must then be personalized (e.g. protocol address, fault detection thresholds, etc.).

Saving the configuration on PC:

This section describes saving of the Flair 200C configuration in file form (Flair 200C ➡ PC direction).
The configuration is saved in the form of a zipped text file: click once on the arrow (Flair 200C ➡ PC) and the Flair 200C automatically creates a compressed text file (file with .zip extension) containing the Flair 200C parameters.

Downloading the configuration from the PC

This section describes downloading to the Flair 200C of the parameters contained in a backup file (PC ➡ Flair 200C direction).
In this mode there is only a single button for downloading.
The Flair 200C automatically detects the type of file downloaded and manages the reading of information accordingly.
It is possible to download two types of files:

- Text file (.txt extension)
- Compressed text file (.zip extension).

Flair 200C settings
Parameters for communication

The Flair 200C is designed to detect automatically the type of modem that is installed on the communication port used for transmission to the Scada system.

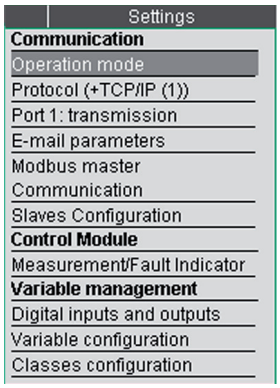
The configuration software automatically proposes a choice of the medium on this port that will correspond to the type of modem installed.

The parameters present in the configuration pages for the port take into account the type of medium that has been selected, because each type of medium has specific configuration parameters.

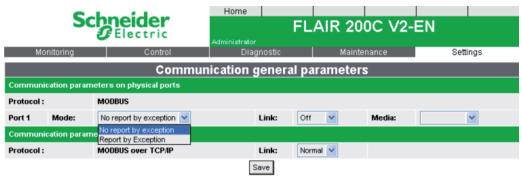
The configuration page for protocol parameters may take also into account certain parameters related to the type of medium selected.

Comment: the protocol parameters related to the type of medium will be described in this chapter.
The other parameters related to the protocol will not be described in detail, however.
For more information concerning the latter, refer to the protocol User Manual.

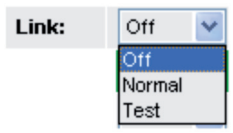
PE57803EN



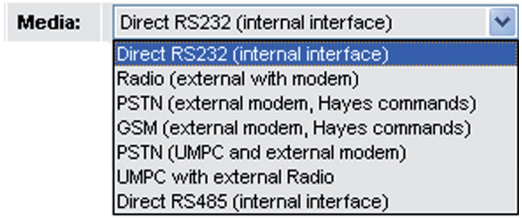
PE57822EN



PE57523EN



PE57562EN



Excerpts from the Operation Mode page

Important note: a medium not configured or incorrectly configured causes an equipment fault (equipment fault Led on the front panel of the product).

Operation Mode Page

Access: ***Settings*** ➞ ***Operation Mode*** menu

Objective of this page: activate the transmission port and select the type of modem to be used and how it will be managed. The parameters for this page can be consulted and/or modified depending on the user profile.

Mode

Allows choice (or merely gives an indication depending on the protocol) of the transmission mode used for dialogue with the Scada system.

■ **Master/Slave:** communicates exclusively in the Scada ➞ Flair 200C direction.
No remote alarm function used in this mode.
Depending on the protocol, the exact title displayed may be:
□ “Asymmetric” (e.g. IEC protocol)
□ “Report by exception” (e.g. Modbus protocol)
□ “No unsollicited response” (DNP3 protocol).

■ **Master/Master:** communicates in both directions, Scada ➞ Flair 200C and Flair 200C ➞ Scada.
The remote alarm function will be used in this mode if one of the modes mentioned below corresponding to the Master/Master mode is configured. On the other hand, the remote alarm function will not be used if the Master/Slave mode mentioned above is configured. Depending on the protocol, the exact title displayed may be:
□ “Symmetric” (e.g. IEC protocol)
□ “Report by exception” (e.g. Modbus protocol)
□ “Unsollicited response” (e.g. DNP3 protocol).

Comment: the “Report by exception” mode is not really a Master/Master mode. It is in fact a Master/Slave mode with the possibility of alarm sending to the Scada system by means of the “Report by exception” function, which from the functional viewpoint resembles a Master/Master mode.

Link

Allows definition of the way in which the ports will be managed according to one of the following modes:
■ **Not used:** no transmission over this channel
■ **Normal:** activation of the transmission channel to the Scada system
■ **Test:** (in radio mode only). Allows a fixed frequency to be generated on the radio network to allow antenna installation adjustment operations or level measurements on fields received on another Flair 200C within range of the first.

Medium

Allows definition of the type of transmission medium to be used for the link to the Scada system. The choice proposed below depends on the type of modem detected:

■ RS232 modem installed on the port:
□ Direct RS232 (internal interface)
□ Radio (external with modem)
□ PSTN (external modem, Hayes command)
□ GSM (external modem, Hayes command)
□ PSTN (UMPC and external modem).

■ RS232/RS485 modem installed on the port:
□ Direct RS232 (internal interface)
□ Direct RS485 (internal interface)
□ Radio (external with modem)
□ PSTN (external modem, Hayes command)
□ GSM (external modem, Hayes command)
□ PSTN (UMPC and external modem).

■ Radio modem installed on the port:
□ 1200/2400 baud FFSK radio (internal modem)
□ 600/1200 baud FSK radio (internal modem)
□ 600/1200 baud LL radio (internal modem).

■ GSM/GPRS modem installed on the port:
□ GSM (internal modem)
□ GPRS (internal modem).

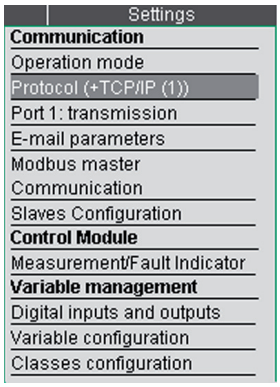
■ GSM/3G modem installed on the port:
□ GSM (internal modem)
□ 3G (internal modem).

■ PSTN modem installed on the port:
□ RTC (internal modem)
□ etc.

Configure the port according to the type of transmission medium wanted based on the proposed choice.

Flair 200C settings
Parameters for communication (cont'd)

PE57804EN



Protocol Page

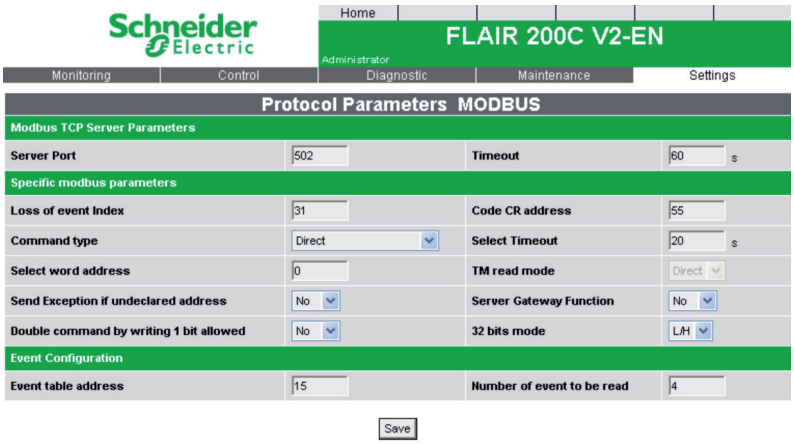
Access: ***Settings*** ➞ ***Protocol (+TCP/IP (1))*** menu

The parameters of this page depend entirely on the type of protocol used. Detailed explanations concerning this page will therefore not be given in this manual.

Refer to the protocol User Manual for details concerning configuration of the parameters of this page.

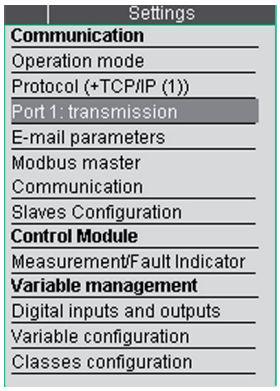
Note that certain parameters of this page depend on the type of modem installed on the ports.

PE57526EN



Flair 200C settings
Parameters for communication (cont'd)

PE57805EN



Port 1: transmission page

Access: ***Settings ➞ Port 1: transmission*** menu

The parameters display for this page depends on the type of modem installed and the transmission medium chosen in the *"Settings ➞ Operation mode"*.

Configuration procedure

The Flair 200C is factory-delivered with a default configuration corresponding to the type of modem installed. The user should then (if need be) adjust the parameters of this page (in particular the modem management signals and associated time delays) depending on what is required for the modems used or possibly the transmission network.

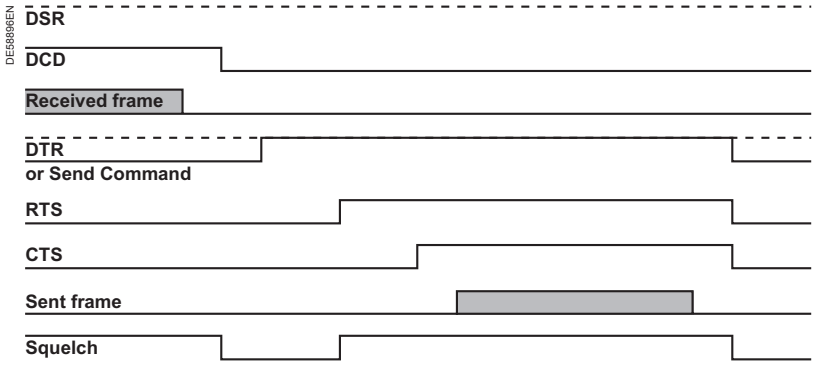
Concerning the adjustment of transmission delays, in theory one starts by configuring high values for all the delays, checking first that dialogue is established between the Flair 200C and the Supervisor.
One starts by gradually reducing the first time delay in order to determine the operating limit of the modem relative to the adjusted signal.
Then, this delay is increased by several tens of milliseconds to keep a safety margin.
The procedure is then started again with the other delays.

This method allows Flair 200C-Supervisor transmission times to be optimized.
In case of doubt concerning the configuration, it is preferable to leave the default values.

Modem management signals

Before going into detail concerning the parameters to be configured, the function of each modem management signal should be explained.
The following timing diagram shows the management signals involved during communication between the Flair 200C modem and the interface or the external radio, or even directly with the control centre.

DE58896EN



■ **DSR** (Data Send Ready):
This signal can be supplied to the Flair 200C to indicate that the control centre (or the modem) is capable of transmitting (or simply that it is energized).
This signal is used only in the case of an RS232 link (not used in radio mode).

■ **DCD** (Data Carrier Detect):
This signal, when it exists, is used to confirm receipt of the received frame.
It can also be used to learn the transmission network occupancy.

■ **DTR** (Data Terminal Ready):
When the control centre uses DSR, DTR is used to indicate that the Flair 200C is ready for transmission (equivalent of DSR but in the other direction).
In radio mode with internal modem: this signal is used by the Flair 200C to switch the radio terminal to sending when it requires different commands for switching to sending and for carrier sending.

■ **RTS** (Request To Send):
This signal actuates sending of the modem carrier.

■ **CTS** (Clear To Send):
After the Flair 200C has performed the Request To Send, the sender sometimes takes a certain time to rise in power before being able to send the messages submitted to it. This is especially true for radio equipment. Accordingly, when the equipment is ready to send, it indicates this to the Flair 200C by causing the CTS signal to rise.

■ **Squelch:** this signal is used only in radio mode to indicate to the Flair 200C the occupancy status of the radio network.

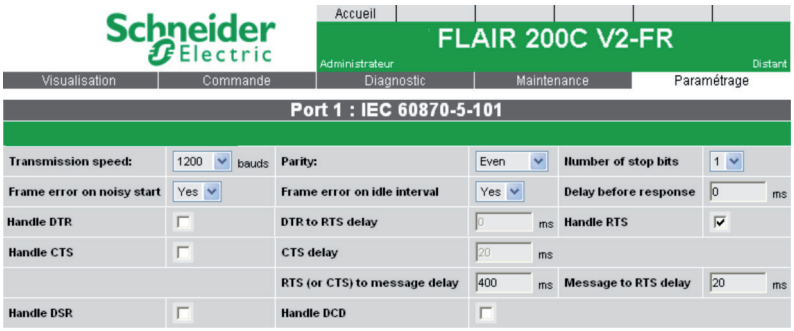
Flair 200C settings
Parameters for communication (cont'd)

Definition of modem management signals and time delays

The Flair 200C allows the user to configure, if necessary, use or non-use of the modem management signals and the various associated time delays.

We give below the list of configurable options concerning these modem management signals. Configuration is performed in the pages for ports 1 and 2 of the Flair 200C Web server:

PE57528EN



■ **Delay before response:** after receiving a message, this is the waiting time before sending the message (response). This delay serves to avoid any overlapping of signals between the message received and the message sent.
This delay is often used with a radio medium or with certain modems which require a time lag to reverse the direction of transmission, i.e. a minimum time to go from receive mode to send mode.

■ **Handle DTR:** if this option is selected, the DTR signal will be managed during transmission exchanges with the modem.

■ **DTR to RTS delay** (if RTS used): time delay between DTR and RTS.

■ **Handle RTS:** if this option is selected, the RTS signal will be managed during transmission exchanges with the modem.

■ **Handle CTS:** if this option is selected, the CTS signal will be managed during transmission exchanges with the modem.

■ **CTS delay** (if CTS used): this is the maximum time during which the Flair 200C waits for the CTS after the RTS has been activated. If, after this delay, CTS has not became active, the Flair 200C discontinues sending the fram.

■ **RTS (or CTS) to message delay -** (if RTS or CTS used): this is the time between transition to the active status of RTS (or CTS if this signal is used) and the start of message sending. Typically, this time delay is used to wait for a stable carrier period established by the modem.
If necessary, when CTS is not available, the time for installation of the carrier to solve the problem posed by the non-availability of this signal can be added to this delay. Likewise, if the DTR and RTS commands are common, the time for rise in power of the sender can be added.
Note: example of delay to be configured on the Flair 200C, depending on the type of radio:
□ Motorola CM 340 or GM340 radio: RTS-Message delay = 150 ms
□ TAIT 811x radio: RTS-Message delay = 100 ms
□ MDS4710 radio: RTS-Message delay = 50 ms.

■ **Message to RTS delay** (if RTS used): this is the minimum time to be waited, after sending a message, before causing RTS and DTR (or Send command) to fall again. This delay prevents the end of the message from being truncated by the premature fall of modem sending.
Note: example of delay to be configured on the Flair 200C, depending on the type of radio:
□ Motorola CM 340 or GM340 radio: Message to RTS delay = 100 ms
□ TAIT 811x radio: Message to RTS delay = 80 ms
□ MDS4710 radio: Message to RTS delay = 50 ms.

■ **Handle DSR :** if this option is selected, the DSR signal will be managed during transmission exchanges with the modem.

■ **Handle DCD:** if this option is selected, the DCD signal will be managed during transmission exchanges with the modem.

Flair 200C settings
Parameters for communication (cont'd)

General parameters (common to the various transmission media)

As a general rule, certain configurable parameters of the port 1 and 2 pages are common to numerous types of modems. We shall describe in detail here the meaning of these parameters and how to configure them.

■ **Transmission speed:** this is the speed of transmission between the Flair 200C and the modem. When an external modem is used, the configured speed is not necessarily the speed that will be used for the link to the Supervisor, because the external modem can use a different speed to that used for the RS232-Flair 200C link.
The choice of available baud rates differs depending on the type of modem installed on the ports. Here are a few examples:
- □ FFSK radio: 1200 or 2400 baud
- □ External radio or internal RS232: 200 to 38400 baud
- □ Internal GSM: 600 to 9600 baud
- □ etc.

■ **Parity:** this is the frame character parity for transmission to the Supervisor.
Some modems do not manage parity. In such cases, the Flair 200C will have to be configured with the "No parity" option. To be defined therefore according to the type of modem used. Of course, the control centre must also be able to be configured in this mode.
Note that when the parity is no longer used, transmission security is diminished and a disturbed frame may be considered correct (see protocol manual for more details concerning this function).
There are four possible configurations: no parity, space, even or odd.
Note: parity is not used in PSTN, GSM, GPRS and FFSK radio links.

■ **Number of stop bits:** this is the number of stop bits used to define the end of a frame during transmission.
There are two possible configurations: one or two stop bits.

■ **Frame error on idle interval:** the Flair 200C is capable of detecting a gap greater than 1 bit between 2 characters of a frame.
With certain protocols, any frame having this feature can be rejected. This allows secure transmission.
This frame rejection will be activated if this option is set to "Yes".
This configuration implies that the supervisor and the modems involved in the transmission circuit ensure that there are no gaps. While this is sometimes true with regard to the supervisor, it is not completely true for many modems (case of packet transmission). In this specific case, "No" should be set. However, transmission security must then be ensured by other means (see User Manual of the protocol used for more information).
Note: this parameter is used only on a radio or LL link.

■ **Frame error on noisy start:** some transmission networks could constantly generate noise just at the start of frame. In that case this option should be set to "No", to avoid systematically rejecting all the received frames which could be considered incorrect. However, the incorrect character generated by the noise located in the frame header will be eliminated when reading the frame, because this character will not correspond to what is expected by the protocol.
Note that, in most cases, this noise does not exist. In such cases, the option should be set to "Yes".
Note: this parameter is used only on a radio or LL link.

Flair 200C settings
Parameters for communication (cont'd)

Parameters specific to each transmission medium

In this chapter we shall describe in detail the configuration parameters specific to each modem (the other parameters having been described in detail in the preceding chapter).

PSTN and GSM media (internal or external modem)

PE57829EN

Port 1 : IEC 60870-5-101					
PSTN (external modem, Hayes commands)					
Transmission speed:	9600 bauds	Parity:	No parity	Number of stop bits	1
Frame error on noisy start	Yes	Frame error on idle interval	Yes		
Dialing type	Pulse	Modem init	&F0%S0=12S0=1&K0%C0E0&W0&Y0		
Caller communication delay	30 seconds	Called communication delay	60 seconds		
Host tel number (main)	0476343444	Host tel number (standby)	0475465767		

■ **Dialling type:** choice of the type of dialling to be used for a telephone call to the supervisor during an alarm sequence.
There are two possible choices: pulse (decimal) and multifrequency (MF).
Note: configuration available in PSTN but not in GSM.

■ **Modem init:** the Modem init sequence is necessary to configure the modem for operation linked to the Flair 200C application.
The default init sequence corresponds to the AT commands necessary for an internal modem. For an external modem, the modem init sequence is not defined in the configuration supplied. It is up to the user to define it according to the brand and model used (refer to the modem manual).
Note: configuration available in PSTN but not in GSM.

■ **Default init sequence:** &F0%S0=12S0=1&K0%C0E0&W0&Y0.
If in doubt, do not change this default init sequence, because the Flair 200C-supervisor link may no longer operate correctly.

■ **Caller communication delay:** maximum delay for connection between the Flair 200C and the supervisor following a call by the Flair 200C before release of the PSTN line by the Flair 200C.

■ **Called communication delay:** maximum delay for connection between the Flair 200C and the supervisor following a call by the supervisor before release of the PSTN line by the Flair 200C.

■ **Telephone number (main):** main phone number that the Flair 200C uses to call the supervisor during an alarm sequence.
The Flair 200C will try to call three times on this "main" number before switching to the "standby" number.
The codes accepted for telephone numbers are:
□ 0 to 9 (for the call number)
□ P (for Pulse = decimal dialling setting)
□ T (for Tone = MF dialling setting)
□ W (for Wait)
□ space bar (for space)
□ + (equivalent to "00" for international dialling).
Example of config.: "P 00W0674948960" or "P +W0674948960".
Note: a space must be inserted between the "T" or "P" and the call number.

■ **Telephone number (standby):** secondary phone number that the Flair 200C uses to call the supervisor during an alarm sequence. This phone number is used only if the main number does not reply (i.e. after three unsuccessful attempts).
The Flair 200C will also try to call three times on this second number before finally stopping calling, unless another alarm occurs, which will have the consequence of reinitiating the alarm calls from the "main" number).
Same comment as for the "main" number concerning the codes to be used for the call number.

Flair 200C settings
Parameters for communication (cont'd)

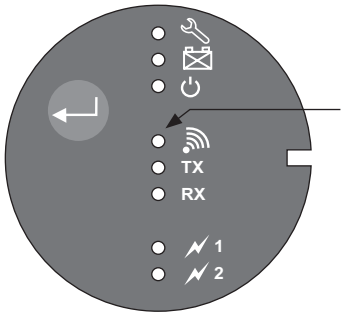
```
09:35:36.702    MODEM - Power up
09:35:37.711    MODEM – Command mode
09:35:38.836    MODEM - Low power mode
09:35:43.873    MODEM - Tx : AT
09:35:44.913    MODEM - Tx : ATE
09:35:45.967    MODEM - Tx : AT+CMEE=0
09:35:47.058    MODEM - Tx : AT\Q3
09:35:48.120    MODEM - Tx : AT^SSYNC=1
09:35:49.218    MODEM - Tx : AT&C1&D2&S0+IPR=0
09:35:50.313    MODEM - Tx : AT+CGSN
09:35:51.396    MODEM - Tx : AT+CPIN?
09:35:52.497    MODEM - Rx : +CPIN: READY
09:35:52.501    MODEM - Tx : AT+CLCK="SC",0,0000
09:35:53.564    MODEM - Tx : AT+CREG=0
09:35:54.617    MODEM - Tx : AT+CREG?
09:35:55.676    MODEM - Rx : +CREG: 0,1
09:35:55.682    MODEM - Tx : AT+CSCS="GSM"
09:35:56.738    MODEM - Tx : AT+CSCA=0689004000
09:35:57.839    MODEM - Tx : AT+CMGF=1
09:35:58.891    MODEM - Tx : AT+CSNS=4
09:35:59.943    MODEM - Tx : AT+CBST=7,0,1
09:36:00.983    MODEM - Tx : AT^SCFG="GPRS/ATS0/
withAttach","off"
09:36:02.113    MODEM - Tx : ATS0=1
09:36:03.200    MODEM - Tx : AT&W
09:36:04.297    MODEM - Tx : AT+CFUN=9
09:36:05.348    MODEM - Tx : AT^SCFG="PowerSaver/
Mode9/TimeOut","100"
09:36:06.529    MODEM - Tx : AT+CREG=1
09:36:07.586    MODEM - Tx : AT+CIND=0,0,0,0,0,0,0,0,1
09:36:08.701    MODEM - Tx : AT+CMER=2,0,0,2
09:36:09.796    MODEM - Modem GSM initialized
```

Example of port trace during an attempt to connect to the GSM network (Modem init)

```
11:38:37.093  SlaveAddr = 03 <<<< Reading N output words
                                  Addr = 0x34
                                  03 03 00 34 00 03 45 E7
11:38:37.113  SlaveAddr = 03 >>>> Reading N output words
                                  03 03 06 A9 AA AA A9 55
00                                F6 9C
11:38:37.357  SlaveAddr = 04 <<<< Reading N output words
                                  Addr = 0x0
                                  04 03 00 00 00 01 84 5F
11:38:37.593  SlaveAddr = 04 <<<< Reading N output words
                                  Addr = 0xf
                                  04 03 00 0F 00 21 B5 84
```

Example of exchange frames during connection established with the supervisor (in Modbus protocol)

DE58897



Yellow indicator lamp: indicates connection to the GSM network

```
11:39:02.593        MODEM - Tx : AT+CMER=2,0,0,2
11:39:03.691        MODEM - GSM modem initialised
11:39:03.710        Receive level :
11:39:03.710        Good
```

GSM medium (internal or external modem)

PE57500EN

Port 2 : IEC 60870-5-101

GSM (internal modem)

Transmission speed:	9600 bauds			**Number of stop bits**	1
				Delay before response	0 ms
		RTS (or CTS) to message delay	0 ms	**Message to RTS delay**	0 ms
Caller communication delay	30 seconds	**Called communication delay**		60 seconds	
Host tel number (main)	0478554678	**Host tel number (standby)**		0478555678	
PIN Number	0000				
SMS service center tel number:	0689004000	**SMS user tel number**		0674948960	
IMEI code	011202000025048				

■ **PIN number:** configuration of the SIM card PIN number on four figures.
NB: after three validations of the page configuration or three modem initializations with an incorrect PIN number, the SIM card is blocked.
The only solution in this case is to call the operator who will be able to unblock it.
The first time that the Flair 200C initializes the GSM modem, the latter asks the modem if it needs the PIN number.
If the modem replies in the negative, the Flair 200C will not manage the PIN number and the latter will not need to be entered by the user.
On the other hand, if the modem replies that it needs the PIN number, the Flair 200C will manage this parameter and the PIN number must therefore be configured.
Once the PIN number has been initialized a first time, the Flair 200C asks the modem to deactivate use of the PIN number.
The latter will therefore no longer be used by either the Flair 200C or the GSM modem.

■ **SMS service center tel number:** this is the number of the service centre of the GSM operator which centralizes and stores all the SMS messages sent to reroute them to the end user.
Contact the operator to know this number. It is also possible to find out this number from a GSM telephone using the same operator as that used by the SIM card of the Flair 200C, because the number can be looked up in the telephone's configuration parameters.
Finally, it is also possible to find out this number in the port trace following connection of the modem to the GSM network. The number is displayed on the line including the "AT+CSCA" command (see enclosed example: number=0689004000).

■ **SMS user tel number:** SMS number that the Flair 200C uses in the event of an alarm sequence to send the text message to the user who is on standby duty.
Same comment as for the "main" telephone number concerning the codes to be used for the telephone number.

GSM modem connection status
To check the connection status of the GSM modem, there are several possibilities:

■ Via the Led on the front of the Flair 200C:
□ the Led flashes 600 ms on/600 ms off: *searching for network* or *no SIM card inserted* or *PIN number not entered* or *limited network service*.
□ the Led flashes 75 ms on/3 s off: idle mode:
The Flair 200C has detected the GSM network.
□ the Led flashes 75 ms on/75 ms off, then 75 ms on/3 s off:
one or more GPRS connections are active.
□ the Led flashes 0.5 s on/off:
depends on network activity / data packet transfer in progress.
The Led stays lit for 1 s after data packet exchange.
□ the Led is lit steadily: the Flair 200C is connected to the network or exchanges parameters with the network.

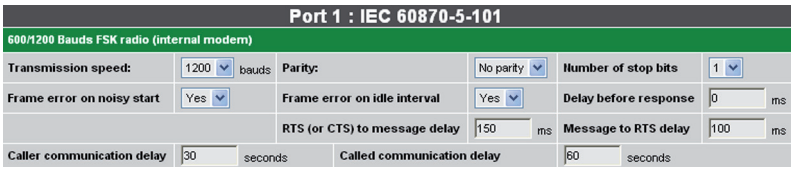
■ By consulting the AT commands for modem initialization in the port trace corresponding to the GSM modem:
□ to the *"AT+CREG"* command requested by the Flair 200C,
the modem should reply *"+CREG: 0.1"* when the modem is connected to the network or *"+CREG: 0.2"* if it is not.
□ moreover, when the remote link is established between the Flair 200C and the supervisor, the port trace also displays protocol frame exchanges between the Flair 200C and the supervisor.

GSM reception levels
It is possible to know the level of the GSM signal received by the Flair 200C modem. This function is very practical to determine whether the Flair 200C can correctly receive frames coming from the supervisor or to adjust the position of the GSM antenna on its support so as to optimize reception. To know the level of the GSM signal received, simply consult the GSM port trace. The reception level is indicated. Once the modem has been initialized, the Flair 200C display automatically changes to indicate the level of the GSM signal received.

Flair 200C settings
Parameters for communication (cont'd)

FSK or FFSK radio medium (internal or external modem)

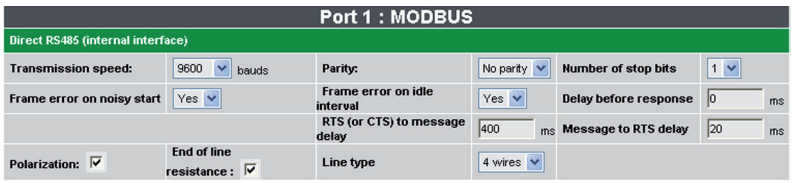
PE57531EN



■ **Caller communication delay:** maximum delay for connection between the Flair 200C and the supervisor following a call by the Flair 200C, before release of the radio link by the Flair 200C.
■ **Called communication delay:** maximum delay for connection between the Flair 200C and the supervisor following a call by the supervisor before release of the radio link by the Flair 200C.

RS485 medium (internal modem)

PE57563EN



■ **Polarization:** if the box is checked, allows the line of the RS485 network to be polarised on the Flair 200C side. The RS485 line must be polarised, commonly on the master side.
■ **End of line resistance:** if the box is checked, activate the load resistance of the RS485 network on the Flair 200C side. The RS485 line must be loaded on each side of the line.
■ **Line type:** type of transmission used: 2 wires or 4 wires.

GPRS or 3G medium (internal modem)

GPRS/3G operating conditions on Flair 200C

For GPRS or 3G communication between the Flair 200C and the supervisor to be able to operate, certain essential conditions must be obtained from the network operator:

■ **The Flair 200C must have a fixed IP address assigned by the operator**
The GPRS or 3G connection will not be able to operate if the Flair 200C has a dynamic IP address, because at the supervisor end it will not be possible to know the new IP addresses assigned to the Flair 200C by the operator following a reassignment. As a result, it will not be possible to initialize a communication protocol from the supervisor.
Likewise, it will not be possible either to log on to the embedded Web server of the Flair 200C remotely from an Ethernet port if the IP address of the Flair 200C is not known.

The only way to know the IP address of the Flair 200C in this case is to log on locally (on site) to the embedded Web server of the Flair 200C via an USB port, which is hardly possible because that would imply going to the site for each enclosure whenever an IP address is reassigned.

As soon as the Flair 200C is connected to the GPRS or 3G network, the IP address assigned to the Flair 200C is displayed in the "Server IP address" field that can be consulted in the *"Maintenance ➡ IP server port"* page (see image below).
It is this address that must be used at the supervisor end to connect to the Flair 200C via Ethernet or via the protocol.

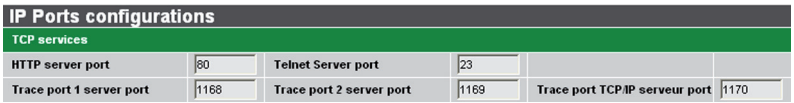
PE57532EN

Comment: when connection to the GPRS or 3G network is not established, dashes ("–") are displayed in place of the IP address.

Example: "HTTP server" port No. 80 is not open with the operator "Orange".
A port number greater than 1024 should be configured on the Flair 200C to have an open port from this operator.

■ **The IP ports used by the Flair 200C must be opened by the operator**
A number of ports are used for the Flair 200C application. The list of ports used can be consulted in the *"Maintenance ➡ IP server ports"* page of the Flair 200C Web server (see image below). All the ports mentioned in this page must be opened at the GPRS/3G operator level for the functions associated with these ports to be able to operate. If this is not the case, it is always possible to select different port numbers in this page to match port numbers available at the operator end.

PE57533EN



Flair 200C settings
Parameters for communication (cont'd)

Note: to check that the modem is correctly connected to the GPRS network, it is possible to consult the trace of the port corresponding to the GPRS modem.
The modem starts by initializing the GSM connection and then the GPRS connection. Accordingly, following the AT commands for connection to the GSM network can be found the commands relating to GPRS connection. At the end of them, the trace should indicate "GPRS modem initialized" with also the indication of the IP address of the Flair 200C assigned by the operator (local=xxx.xxx.xxx.xxx) and that of the GPRS operator's gateway (dest=xxx.xxx.xxx.xxx). See example below.

```
11:34:16.068        MODEM - GPRS modem initialisation
start
11:34:16.068        MODEM - On
11:34:17.077        MODEM - Command mode
11:34:18.196        MODEM - Sleep mode
11:34:23.233        MODEM - Tx : AT
11:34:24.277        MODEM - Tx : ATE
11:34:25.362        MODEM - Tx : AT+CMEE=0
11:34:26.422        MODEM - Tx : AT\Q3
11:34:27.483        MODEM - Tx : AT^SSYNC=1
11:34:28.545        MODEM - Tx : AT&C1&D2&S0+IPR=0
11:34:29.620        MODEM - Tx : AT+CGSN
11:34:30.727        MODEM - Tx : AT+CPIN?
11:34:31.797        MODEM - Rx : +CPIN: READY
11:34:31.804        MODEM - Tx : AT+CLCK=»SC»,0,0000
11:34:32.885        MODEM - Tx : AT+CREG=0
11:34:33.937        MODEM - Tx : AT+CREG?
11:34:34.995        MODEM - Rx : +CREG: 0,1
11:34:35.002        MODEM - Tx : AT+CSCS=»GSM»
11:34:36.057        MODEM - Tx : AT+CMGF=1
11:34:37.112        MODEM - Tx : AT+CSNS=4
11:34:38.164        MODEM - Tx : AT+CBST=7,0,1
11:34:39.207        MODEM - Tx : AT^SCFG=»GPRS/ATS0/
withAttach»,»off»
11:34:40.346        MODEM - Tx : ATS0=1
11:34:41.396        MODEM - Tx : AT&W
11:34:42.487        MODEM - Tx : AT+CFUN=9
11:34:43.541        MODEM - Tx : AT^SCFG=»PowerSaver/
Mode9/TimeOut»,»100»
11:34:44.723        MODEM - Tx : AT^SGAUTH=1
11:34:45.817        MODEM - Tx : AT+CGDCONT=1,»IP»,»in
ternet-entreprise»
11:34:46.950        MODEM - Tx : AT+CGATT=1
11:34:51.225        MODEM - Tx : AT+CGREG?
11:34:52.301        MODEM - Rx : +CGREG: 0,1
11:34:52.308        MODEM - Tx : ATD*99***1#
11:34:53.880        MODEM - Rx : CONNECT
11:34:53.881        MODEM - Connect
11:34:54.888        MODEM - PPP link:  UP -> ESTABLISH ()
11:34:55.059        MODEM - PPP link:  OPEN -> AUTH ()
11:34:55.102        MODEM - PPP link:  PAP : Local
successfully authenticated
11:34:55.104        MODEM - PPP link:  SUCCESS ->
NETWORK ()
11:34:55.104        MODEM - PPP link:  IPCP UP ->
NETWORK ()
11:34:56.340        MODEM - PPP link: connected,
local=90.95.65.78, dest=212.234.96.90
11:34:56.341        MODEM - GPRS modem initialized

08:49:44.335        MODEM - PPP link: UP -> ESTABLISH ()
08:49:44.350        MODEM - PPP link:  OPEN -> AUTH ()
08:49:44.363        MODEM - PPP link:  PAP: Local
successfully authenticated
08:49:44.363        MODEM - PPP link:  SUCCESS ->
NETWORK ()
08:49:44.363        MODEM - PPP link:  IPCP UP ->
NETWORK ()
08:49:44.400        MODEM - PPP link:  IPCP CONFIGURED
-> NETWORK ()
08:49:44.401        MODEM - PPP link: connected,
local=90.95.65.78, dest=212.234.96.90
08:49:44.401        MODEM - GPRS modem initialized
```

Example of port trace in the event of a connection to the GPRS network

Configuration of GPRS or 3G parameters

PE57534EN

Port 2					
GPRS					
Access Point Name	internet-entreprise		**PIN Number**	0000	
Dayly disconnect	☐	**Disconnect hour**	0	**PPP session timeout**	5 min
Specific Ping IP Address		0.0.0.0		Test Ping	
Ping time interval	4 min	**Ping attemps**	3	**Ping timeout**	5 s
Authentification	☐	**Login**		**Password**	
IMEI code	011202000025048				

■ **Access Point Name:** name of the access point for connection to the GPRS/3G network. This name is generally given by the operator who provides access to the GPRS/3G network (e.g. "internet-entreprise" for the operator Orange).

■ **PIN number:** same as for GSM modem

■ **Daily disconnect:** one of the special features of GPRS/3G operation is that in some cases of network unavailability, the Flair 200C does not detect this link break. The Flair 200C will therefore remain connected continually to the network (unavailable) even though the physical link is broken. The Flair 200C can therefore remain indefinitely in this mode and will no longer have a means of reconnecting to the network, even if is available again, because to do so it would have to be forced to disconnect from the network to then be able to reconnect. As a consequence, without a means of forcing automatic disconnection/reconnection, the Flair 200C will not by itself be able to restore connection to the network.
The "Daily disconnect" option has therefore been provided to perform this role and thus allow Flair 200C disconnection from the GPRS/3G network to be forced automatically so as to reconnect it immediately afterward.
This disconnection can be programmed for a fixed time each day by means of the *"Disconnect hour"* parameter. This system works, but has the disadvantage that in the worst case scenario the Flair 200C may remain for at most 24 hours without any real connection to the network (case of a brief network failure occurring just after the daily disconnection time).

■ **Disconnect hour:** configuration of the selected daily disconnection time according to the criteria described previously in "Daily disconnect". This option should be entered only if the *"Daily disconnect"* option is used.

■ **PPP session timeout:** configuration of the maximum time delay before disconnection of the Flair 200C from the GPRS/3G network, if the Flair 200C detects no IP data flow.

■ **Specific Ping IP Address:** the ping in theory makes it possible to verify and measure the quality of the equipment's connection with another device connected to the IP network. This configurable parameter can determine to what IP address will be sent the packet corresponding to the ping allowing this quality to be measured. Configure, for example, a known Web server IP address or possibly that of the supervisor, provided that the latter incorporate a known fixed IP address.
The configured address must correspond to a standard IP address format, i.e. be in the form of four values of at most three digits separated by a dot (e.g. 192.168.2.101).

■ **Ping test:** allows manual activation of the ping test. A click on this button starts a manual ping test. This manual test is generally used to verify Flair 200C connection to the GPRS/3G network immediately. The Flair 200C then displays the result of the test in a specific window (see enclosed windows). There are two possible results following this test: *"Ping Ok"* or *"Ping failed"*.

■ **Ping time interval:** time between two successive automatic "Ping tests".

■ **Ping attempts:** maximum number of attempts for the "Ping test" when no reply is received from the remote IP address.

■ **Ping timeout:** maximum time of waiting for the reply during the "Ping test" to define "Ping failed".

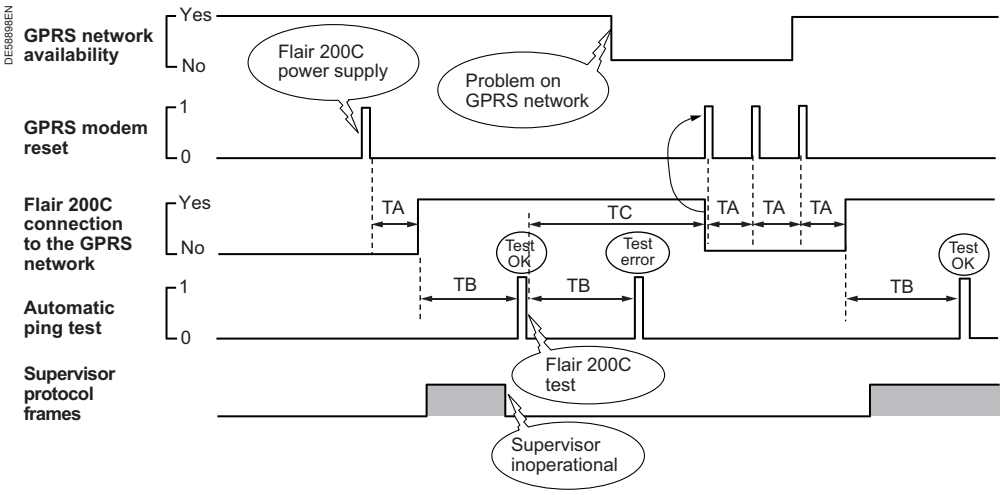
■ **Authentication:** when the GPRS/3G network requires authentication during the connection phase, it is possible in such cases to activate this function by checking the corresponding box.
The authorized encryption protocols are: PAP, CHAP, MSCHAP, MSCHAP V2.

■ **Login:** configuration of the login used for authentication. Configure this field only if the *"Authentication"* option has been checked.

■ **Password:** configuration of the password used for authentication. Configure this field only if the *"Authentication"* option has been checked.

Flair 200C settings
Parameters for communication (cont'd)

Operating principle of the regular ping test



TA = Time for modem initialization + connection to the GPRS/3G network (approximately 1 min.)
TB = Ping test period (4 min.)
TC = Modem reset time (= 5 min.) if IP data flow non-existent on the Flair 200C

The Flair 200C uses the regular ping test as a means of extending connection to the GPRS/3G network, when the supervisor is no longer capable of implementing the communication protocol with the Flair 200C even though the GPRS/3G network is still operational. Now, the Flair 200C is designed to monitor the IP data packet flow reaching it via the GPRS/3G network.
A 5 min. time delay (*"PPP session timeout"*) automatically disconnects the Flair 200C from the GPRS/3G network if no IP data flow reaches the Flair 200C. Accordingly, if the Flair 200C is disconnected from the network, the modem will be reinitialized, thereby making the Flair 200C unavailable for 1 min., the time needed for reconnection of the modem to the GPRS/3G network.

To avoid this drawback, the regular ping test is used to prevent disconnection of the Flair 200C when the problem is exclusively due to the supervisor and not to a network problem. In other words, if the Flair 200C is still connected to the GPRS/3G network, there is no reason to disconnect it because of a non-existent IP protocol flow.

As soon as a ping address has been configured in this field, every 4 min. ("Ping time interval") the Flair 200C will attempt to send a ping to the specified IP address. Accordingly, an IP data flow will return to the Flair 200C and the latter will not cut off the connection to the network.

If the result of the ping test is satisfactory, the Flair 200C will remain connected to the network, because it knows that it is available. The Flair 200C will then do nothing in particular except for the next ping test after the next 4 minutes have elapsed.

If the result of the ping test is unsatisfactory, after an extra minute the Flair 200C, seeing no IP data flow for the last 5 min., will disconnect from the network automatically (modem reset), and then attempt (after completion of modem initialization) to reconnect to the network again.

If the network is still not available, the Flair 200C will again request the modem to reinitialize immediately, and this indefinitely until the next detection of the network. This phase of initialization and reconnection to the network requires approximately 1 min. for the GPRS/3G modem (see enclosed diagram).

If the ping address is set to "0.0.0.0" (default value), the regular ping test is deactivated.

Comment: the regular ping test method is preferable to the "Daily disconnect" method because, for the regular ping test, network disconnection lasts only 5 min. at most during a brief failure (case of network disconnection just after the ping test).

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Note: the regular (or manual) ping test sends to the specified IP address the smallest possible number of data packets (equivalent to 0 byte), to avoid the extra cost of an IP data flow transfer.

■ **Connection speeds in TCP/IP communication :** Depending on the connection type, the Flair 200C/ Scada link can be implemented at different speeds. This is a maximum connection speed. They depend on many factors such as the network's availability, the received signal level or the location of the receiver.
□ GPRS : max. bit rate = 19.2 kbits/s (in practice)
□ EDGE: max. bit rate = 64 kbits/s (in theory)
□ 3G: max. bit rate = 2 Mbits/s (in theory), 115 kbits/s (in practice)

■ **Automatic switchover of the 3G modem :** The 3G modem has the feature that it can automatically switch over to EDGE or GPRS mode if the 3G connection is momentarily unavailable, with the possibility of returning to 3G mode automatically if connection is restored. This provides a backup for the TCP/IP link. Connection is therefore preserved in the event of a network problem, on condition that the other EDGE or GRPS modes are available. Only the transmission rate is affected by this automatic switchover from one network to another.

Flair 200C settings
Parameters for communication (cont'd)

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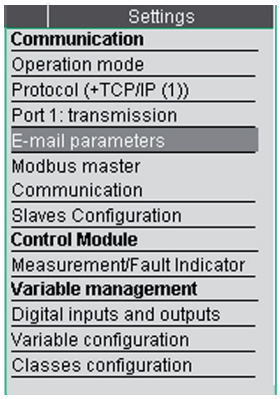


E-mail parameters Page

Access: ***Settings*** ➡ ***E-mail parameters*** menu

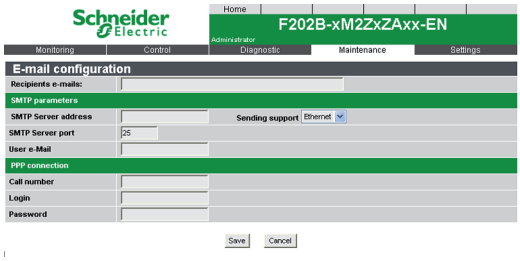
The page E-mail parameters allow the configuration of the e-mail parameters.
At most three recipients can receive the e-mail.
The e-mail type alarm can be sent from the Ethernet port, or from a GSM/GPRS modem. An internet subscription must be taken out with an Internet service provider or a telephone operator (for sending e-mails by GPRS).

In the case of an ADSL type subscription (the e-mail will be sent from the Ethernet port), the Internet service provider generally proposes the address of an SMTP server.

In the case of an old Internet subscription, the Flair 200C can dial the number of a remote server and create a PPP session with that server. The e-mail will then be sent by the GSM port.
For e-mail sending in GPRS, a known SMTP server must be declared.
This may, for example, be the SMTP server of the ISP.

In order to send e-mails, the user needs to select the variable (s) which will be sent (see chapter "Variable configuration").

PE57807EN



E-mail configuration

Parameter	Description
Recipients e-mails	Enter the e-mail of the recipients. At most three recipients can be entered per level (separated by a ; no space between them)

SMTP parameters

Parameters	Description
SMTP server address	Address of the SMTP server. This address can be defined in the form of an IP address (e.g.: 80.45.2.58) or a domain name (e.g.: smtp.free.fr). Where a domain name is used, make sure to configure the address of the DNS server correctly (Maintenance/ IP parameters menu)
SMTP server port	Port associated with the remote SMTP server. By default, the SMTP protocol is defined on port 25. However, this port can be changed
User e-mail	Corresponds to the "from" field of the e-mails sent. With certain Internet service providers, this field must be that given by your ISP. It is declared on their SMTP server.
Sending support	Choice of sending medium: GSM / GPRS / Ethernet

PPP connection (if GSM)

To send an e-mail from a GSM modem, it is necessary to create a PPP connection with the ISP's access point. This access point number is provided to you by the ISP in the case of low-speed connection.

Parameters	Description
Call number	Telephone number of the ISP access point
Login	User name. Provided by the ISP
Password	Password needed to establish the PPP connection. Provided by the ISP

The menu Trace port 1 displays the sending sequence.

PE57808

The SMS messages and emails contain the following information:

■ **Identification of the substation**
- □ equipment type (F200)
- □ slave address in Modbus, link address in IEC, etc.
- □ name of substation (configurable)

■ **Identification of the variable**
- □ variable name (configurable)
- □ variable state (configurable text associated with state 0 or 1 for digital, value + unity for analogue)
- □ change of state time.

■ **Example of SMS message**

F200 125, Salvagny substation. Digital input 1: Deactivated 25/10 17:35:45

■ **Example of e-mail**

ALARM DETECTED

Equipment:
F200 17, RUE DU STADE.

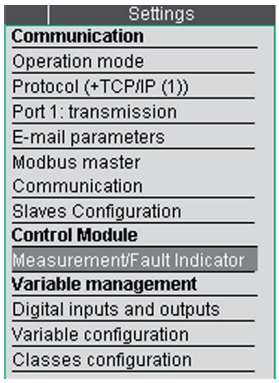
Indication:
Defaut_depart1: Inactive 01/01 05:13:03

End

Flair 200C settings

Parameters of the measurement and fault detection module

PE57810EN



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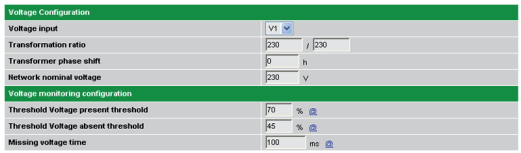

Remote configuration

The @ sign alongside each parameter of “Control & automation” page and “Measurement and fault indicator” page allows to configure an external address.
This external address can be used by the SCADA, to configure or define remotely a new value for the parameter associated, via the communication and the protocol. To set the parameter, an analogue value can be written to this address.

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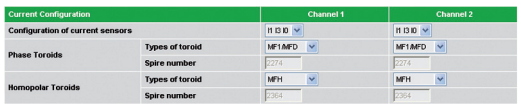

(1) NB:
□ the maximum acceptable current on the toroid inputs is 6 A.
□ the Flair 200C was designed jointly with the toroids of the Easergy range to obtain a measurement accuracy of between 2% and 5%. This accuracy is not guaranteed if sensors other than those mentioned above are used.

Measurements/Fault Detector Page

Access: ***Settings ➟ Measurements/fault detector*** menu

The Measurements/fault detector page allows setting of the parameters relating to measurements and fault detection, namely:
- Type of mains frequency
- Voltage and current measurement parameters
- Fault detection thresholds and time delays (according to options selected).

Each Flair 200C product can manage up to 2 incoming or outgoing lines.
The measurements/fault detection function requires the installation of toroids in the cubicle for each channel.

Configuration of network characteristics

Parameter	Description	Configuration range
Network frequency	Choice of mains frequency	50 Hz or 60 Hz

Voltage measurement and monitoring settings

The following voltage measurement and monitoring parameters are displayed.
Note: depending on the option selected when buying the Flair 200C (power measurement or not), some parameters will not be displayed in the page.

MV voltage measurement is performed based on the LV voltage image.

Parameter	Description	Configuration ranges
Voltage input	Voltage input coming from the 3 phases transformer. Choose the line-to-neutral voltage V1, V2 or V3 in accordance with the power supply of the Flair (if the Flair 200C is power supplied by phase 1, 2 or 3 of the TP *)	V1, V2, V3
Transformation ratio**	Transformation ratio of the VT powering the Flair 200C	100 to 36000 V/90 to 270 V
Transformer phase shift**	Phase shift, in hours, introduced by the VT powering the Flair 200C. Essential for power measurement	0 to 11 h
Network nominal voltage**	Nominal voltage of the MV line	From 20 to 36000 V
Voltage present threshold	Minimum threshold for acknowledging voltage presence	70% to 120%
Voltage absent threshold	Maximum threshold for acknowledging voltage absence	5% to 95%
Missing voltage time	Time delay for acknowledging voltage loss or return	From 20 to 800 ms (in 10 ms increments)

(*) The Flair calculates power by measuring the LV voltage and current flowing in phase 1, 2 or 3. It is therefore essential to have connected the phase 1, 2 and 3 toroid to the corresponding connectors of the Flair 200C (marked I1, I2, I3 on the enclosure).

(**) **Power calculation for the Flair 200C has been designed to work based on line-to-neutral voltages**. However, it is possible to use a line-to-line voltage, so long as one remains within the toleranced ranges withstood by the product. In this case, the transformation ratio and phase shift factors should be changed accordingly.
Phase shift in hours: 0 h = 0°; 1 h = 30°; 11 h = 330°.

Current measurement settings

There are two possible choices concerning the toroid setup on the line:
- Three phase toroids (Configuration: I1, I2, I3)
- Two phase toroids and one zero sequence toroid (Configuration: I1,I3,I0).

The number of toroid turns should also be entered when toroids having characteristics different from those provided by the manufacturer are used.

Parameter		Description	Configuration ranges
Configuration of current sensors		Choice of type of toroid setup: - 3 phase toroids (I1, I2, I3) or - 2 phase + zero sequence toroids (I1, I3, I0)	I1, I2, I3 or I1, I3, I0
Phase toroids	Types of toroid	Types of phase toroids used	MF1/MFD, SOR97200 =S=, 2200/1, 500/1, other types
	Spire number	If the type of toroid is “other”, enter the number of phase toroid turns (1)	Between 50 and 2500 turns
Zero sequence toroids	Types of toroid	Types of zero sequence toroids used	MFH, SOR99120 =S=, 2200/1, 500/1, other types
	Number of turns	If the type of toroid is “other”, enter the number of zero sequence toroid turns (1)	Between 50 and 2500 turns

Flair 200C settings
Parameters of the measurement and fault detection module (cont'd)

Circuit breaker protection side	Flair 200C side
Iphase threshold = 350 A	Iphase threshold = 330 A
I0 threshold = 45 A	I0 threshold = 40 A
Delay, Imax. = 250 ms	Delay, Imax. = 225 ms
Delay, I0 = 250 ms	Delay, I0 = 225 ms

Example of fault detector configuration

Why a reset time upon voltage or current return?
Once the fault has been indicated by the Flair 200C, it is stored in memory so long as the mains voltage is absent (this indication is given either by voltage loss on the LV terminals, or by current loss on the line), to be able to locate the fault on the network during general interrogation of the Flair 200C devices from the supervisor. By default, this memory is cleared upon mains voltage return (configurable parameter).

Ammetric type fault detection settings

In ammetric type detection, the Flair 200C constantly monitors the current value of each phase. When a threshold (followed by voltage loss) is reached, the Flair 200C indicates the presence of a fault. This type of detection is common in networks with resistive neutral or earthed directly.

General rule for configuration

The thresholds Imax and I0 should be set on the Flair 200C to correspond to those set on the upstream circuit-breaker protection device.
In theory, the fault detection thresholds and time delays to be set on the Flair 200C should be slightly less than those of the upstream circuit-breaker protection device so that the Flair 200C may detect presence of the fault current before opening of the circuit breaker.

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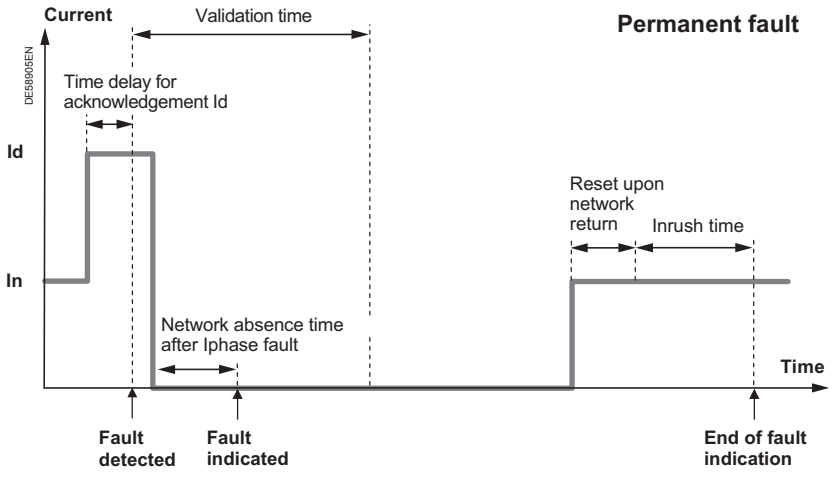
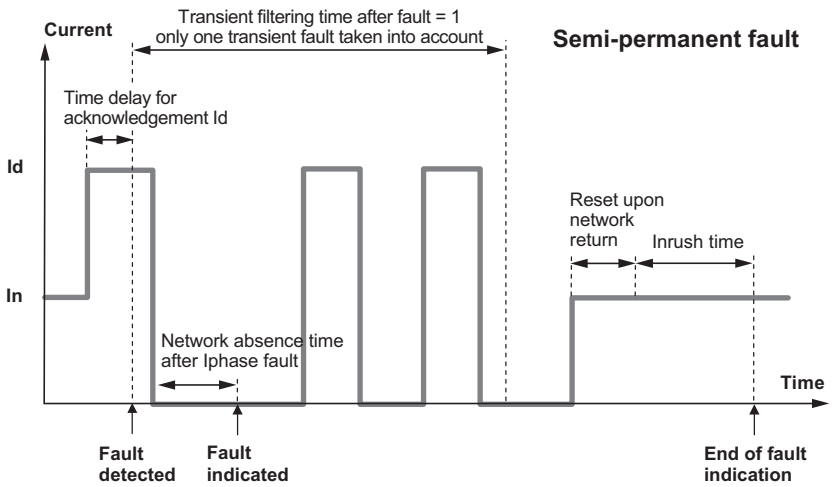
Fault Passage Detection configuration		Channel 1	Channel 2
Type of fault detection		Ammeter	Ammeter
Network presence	Network presence	using current @	using current @
	Inetwork powered	13 A	13 A
	Inetwork not powered	10 A	10 A
Network absence time after Iphase fault		5000 ms @	5000 ms @
Fault current thresholds	I Phase	500 A @	500 A @
	I0	50 A @	50 A @
Time delay for acknowledgement	I Phase	70 ms @	70 ms @
	I0	70 ms @	70 ms @
Reset upon network return		@	@
Transients filtering time after fault		5 s	5 s
Validation time		70 s	70 s
Inrush			
Confirmation time delay		3 s	3 s
Automatic FPI reset		2 h	2 h





Flair 200C settings

Parameters of the measurement and fault detection module (cont'd)

Configuration parameters

Parameter	Description	Configuration ranges
Type of fault detection	Choice of earth fault detection. ■ Ammeter type ■ None: the Flair merely performs monitoring (calculation of currents, voltage, etc.) ■ ICC: detection of the ICC type (see following chapter) is possible only if the Flair 200C has been bought with the "ICC" option)	Ammeter type None ICC
Network presence	A fault on the network is confirmed by a voltage loss. Choice of the type of network presence/absence indication for confirmation of the fault: indication by the presence/absence of LV voltage or by the presence/absence of current flowing in the toroids.	Using current/using voltage
Inetwork powered	Only if network presence by current is selected. This field is calculated automatically from the "Inetwork not powered" field. For a line current greater than this current, the Flair 200C indicates a network presence.	
Inetwork not powered	Only if network presence by current is selected. However, this Inetwork not powered is verified even if network presence by voltage is selected. For a line current smaller than this current, the Flair 200C indicates a network absence. Make sure that the current entered is greater than the capacitive currents.	Between 10 and 800 A
Network absence time after Iphase fault	Time after which the network is considered as absent (by current or by voltage) following a fault	Between 100 and 6000 ms in increments of 10 ms
Fault current threshold Iphase max.	Imax fault current detection threshold	Between 40 and 800 A
Fault current threshold I0	Homopolar fault current detection threshold	Between 2 and 160 A ***NB:*** homopolar detection between 2 and 20 A is possible only if a zero sequence toroid is installed
Time delay for acknowledgement Iphase	"Phase Imax" fault filtering time. Any fault greater than Imax and of a duration exceeding this time will be acknowledged by the Flair 200C	Between 40 and 800 ms
Time delay for acknowledgement I0	"Homopolar I0" fault filtering time. Any fault greater than I0 and of a duration exceeding this time will be acknowledged by the Flair 200C	Between 20 and 800 ms
Reset upon network return	Reset (if checked) or not of the fault detection indication stored in memory upon network return	Box checked or not
Transient filtering time after fault	Unmodifiable. Following detection of a first fault, a filtering time delay is activated. The new transient or rapid faults will then not be acknowledged during the filtering period. This limits the number of transient fault signals (e.g. reactivating faults not seen by the upstream protection, for example)	
Inrush	Temporarily inhibits fault detection upon voltage return	Set in factory at 3 s
Validation time delay	Waiting time for a network absence (by current or voltage) after exceeding the Imax or I0 current. This is a time delay for confirmation of the fault.	Set in factory at 70 s
Automatic FPI reset	Maximum time delay for indication of a current fault. After this time, the fault is automatically erased	Between 1 and 12 h

Flair 200C settings
Parameters of the measurement and fault detection module (cont'd)

ICC type fault detection settings

In the case of compensated neutral networks, the value of the earth fault is low relative to the value of the capacitive currents. As a consequence, ammetric detection cannot be used for an earth fault.
ICC (Capacitance Current Insensitive) fault detection enables earth fault detection on a compensated neutral network.
This algorithm is based on the recognition of electric signals.

Configuration parameters

The parameters absent here are described in the preceding chapter, "Ammetric type fault detection settings".
The factory settings are suitable for most electrical networks.

Parameter		Description	Configuration ranges
Network presence	Inetwork presence threshold	For a line current greater than this current for a period exceeding the "Current presence time", the Flair 200C will confirm a network presence	Between 2 and 20 A
	Inetwork absence threshold	For a line current less than this current for a period exceeding the "Current absence time", the Flair 200C will confirm a network absence	Between 2 and 20 A
	Presence current time	Confirmation time for the detection of network presence	Between 40 and 800 ms
	Missing current time	Confirmation time for the detection of network absence	Between 40 and 800 ms
Fault current thresholds	Iphase	For phase fault detection, ammetric type detection is used (see preceding chapter). This field corresponds to the detection threshold Imax	Between 40 and 800 A
	I0 (*)	Threshold for detection of homopolar current	Between 2 and 160 A ***NB:*** homopolar detection between 2 and 20 A is possible only if a zero sequence toroid is installed
Time delay for acknowledgement	Iphase	"Phase Imax" fault filtering time. Any fault greater than Imax and of a duration exceeding this time will be acknowledged by the Flair 200C	Between 40 and 800 ms
Operation with sustained fault	Validated	Check the box if a fault does not cause opening of the upstream circuit breaker and if operation takes place on the remaining 2 phases	Checked or not
	Minimum current	Operation with sustained fault is authorized only for a residual current greater than this value after the fault. When the residual current value returns below this threshold, the fault indication is reset.	Between 2 and 20 A
	Time	Sustained fault filtering time. Any fault greater than the minimum current and of a duration exceeding this time will be acknowledged by the Flair 200C	Between 1 and 100 s
Network time without fault		In the event of a network return, period during which no fault should appear on the line in order to stop fault indication and return to healthy operation	Between 1 and 10 s

(*) In the ICC detection, the I0 threshold is specified as an instant value. All the other thresholds are expressed as a true value (for ammetric and ICC detection).

Flair 200C settings
Logical input/output parameters

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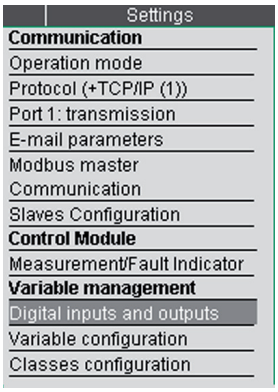

Digital input/output Configuration Page

Access: ***Settings*** ➟ ***Digital inputs/outputs*** menu

The Flair 200C has 6 digital inputs and 3 outputs.

With each input/output is associated an internal variable (TSS/TCL) on which a specific processing operation can be performed (archives, alarms, etc.).
The description is given in the following chapter.

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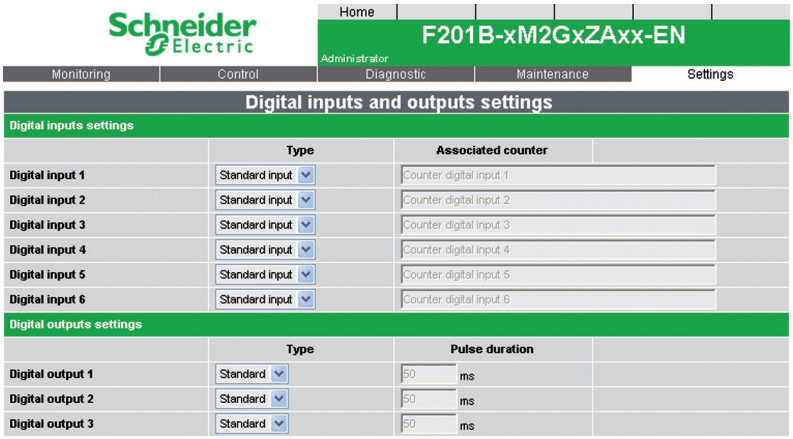

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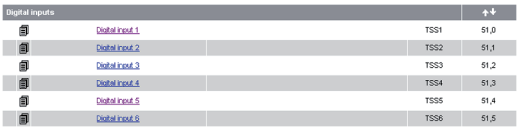
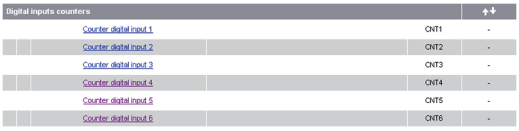


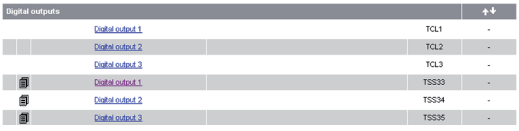
"Digital input" variables

PE57544EN



"Counter" variables

PE57545EN



"Digital output" variables

Digital input configuration

Standard input	The internal variable goes to 1 when the digital input is active
FPI input	The internal variable goes to 1 when the digital input is active and causes the external indicator terminal (external lamp) to flash

Each digital input has its associated counter (counting frequency: 5 Hz).
These counters are created by default on receiving the product.
See counter settings in following chapter.

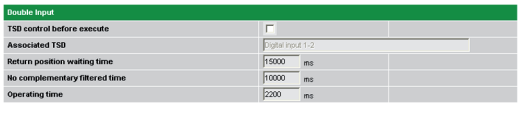
Digital output configuration

Standard output	The output is maintained when the associated variable (TCL command) goes to 1.
Pulse output	Activation of the command generates on the output a pulse of configurable duration (see below). The pulse output is useful for resetting an external fault detector if necessary
Pulse duration	When a pulse type output is selected: period during which the digital output will be active when transmitting a command. Configurable between 50 ms and 5 s in increments of 5 ms
Double output	Some switches are activated by double outputs orders. It is necessary to use an adapted equipment (power relays/not provided) connected to the outputs of the Flair 200C. The orders are sent via outputs 1 and 2. The switch state positions must be connected on digital inputs 1 and 2 of the Flair 200C. The table below indicates the relation between the states of the digital inputs and the states of the switch position:

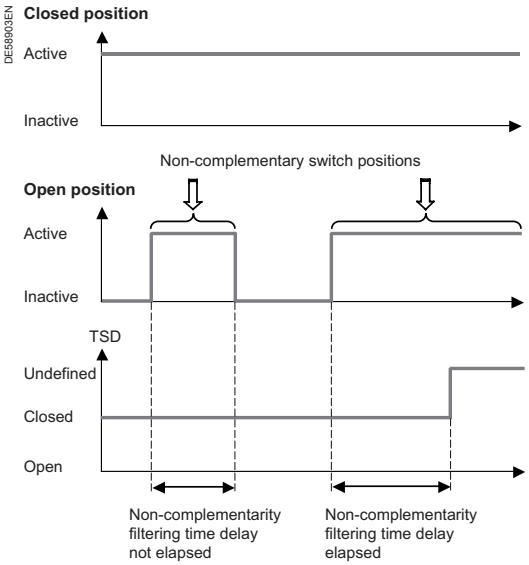
		Digital input 2	
		0	1
Digital input 1	0	Undefined state	Active state
	1	Inactive state	Undefined state

Each output (simple or double) has an associated command (TCL or TCD type) and position (TSS or TSD type) variable.
The TSS and TSD makes it possible to trace the output's position.
If the "double" output type is selected, the following parameters are displayed.

PE57813EN



Flair 200C settings
Logical input/output parameters



Filtering principle for indication inputs related to remote controls

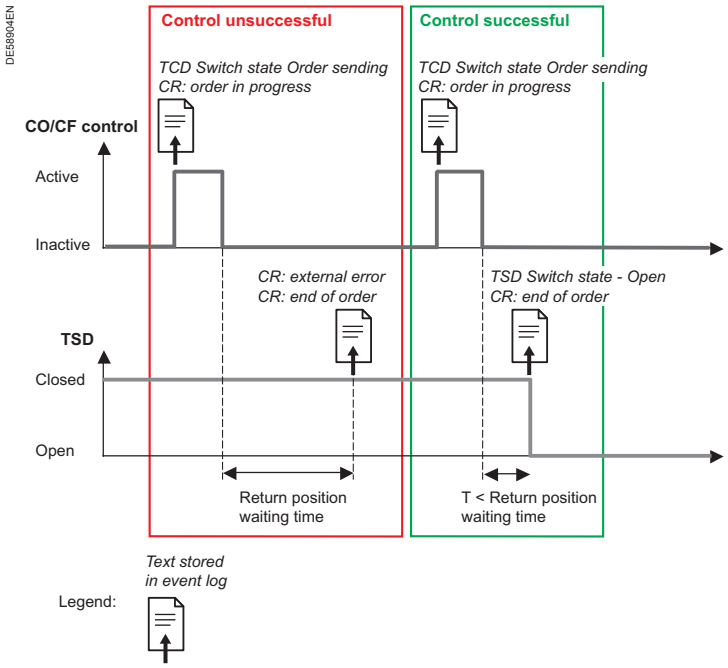
The interface between the Flair 200C and the switch includes two outputs for control and two inputs for the current switch position.

The Flair 200C systematically performs a consistency check on the positions read: it is in theory impossible to have the "open" and "closed" signals simultaneously or neither of the two signals at the same time, but this may occur following a system malfunction.
In the case of non-complementary values, filtering is applied and the old TSD value is kept during a configurable time delay (see No complementary filtered time parameter). If the non-complementary persists after the time delay, this is probably due to a fault relating to the signals delivered by the switch and the "undefined" state is finally indicated in the TSD associated with the position.

Principle of operation

The principle of an order on the switch is to activate digital input 1 and 2 for a determined time (Operating time parameter).
The duration of the order is therefore fixed by this time delay and does not depend on the time taken by the switch to change position.
The Open and Closed switch position inputs are read constantly throughout the duration of the order with a consistency check so as to update the associated position TSD variable (see Filtering principle for indication inputs related to remote controls).

After the control relay has fallen, the order is considered as completed by the Flair 200C when the switch indicates a position in conformity with the order (the TSD is updated with the new status). The order is considered in error (e.g. external error) if the position is not in conformity with the requested order or if undefined after a loss of position filtering time delay (Return position waiting time).



Before each new order, the Flair 200C checks the consistency of the digital inputs. If the box "TSD control before execute" is checked, then only the complementary order of the TSD is accepted. If the box is not checked, the 2 orders are accepted (10 or 01).

Flair 200C settings
Variable configuration

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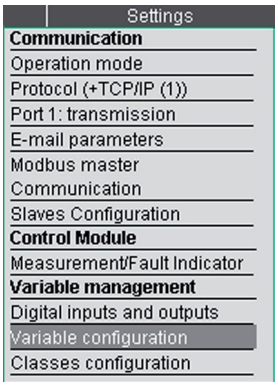
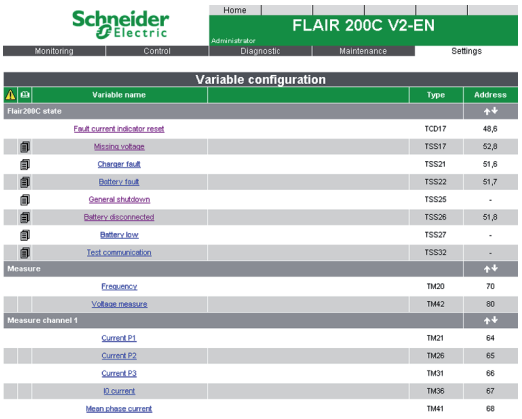


PE57547EN



Different types of variables existing on Flair 200C

PE57548

Example of configuration with or without event and alarm saving

Variable Configuration Page

Access: ***Settings*** ➟ ***Variable configuration*** menu

Definition of variables

The Flair 200C is supplied as standard with all the variables necessary for operation of the equipment. This configuration takes into account all the options installed on the equipment (number of channels, type of modem, protocol, other options, etc.). The user can, however, modify this configuration to adapt it to his needs, for example to add options later or to modify the operation of certain functions (e.g. fault detector thresholds, alarms, communication parameters, etc.).

The Flair 200C Web server provides access to all the variables defined by default on the Flair 200C.
The level of access to a variable (visible in read-only mode, accessible in write mode, not visible) depends on how the variables have been configured.
The parameters for this page can be consulted and/or modified depending on the user profile.

With the factory settings, you must be an administrator to be able to change the level of access to a variable.

The variables present in this page are grouped by classes.
In each class, a number of variables of several different types are found ("type" column).

Variable types

The variables break down into several types presented in the table below.

Type	Use	Description
TCD	Double telecommand	Allows sending of a double command to reset fault detection (*"Fault detection reset double command"* variable)
TCL	Single telecommand	Allows sending of a single command to control the digital outputs of the Flair 200C
TSS	Single telesignal	Indication of binary status (presence, absence) of certain information managed by the Flair 200C (DI, current faults, etc.)
TSD	Double telesignal	Indication of the state of the digital outputs
TM	Telemeasurements	Analogue measurements performed by the Flair 200C (current, voltage, etc.)
CNT	Counters	Fault or energy counter

In the standard version it is not possible to add extra variables to those already created as standard.
Note: however, when the "local Modbus network" option is present in the equipment, it is possible to add variables corresponding to this option (see "local Modbus network" User Manual for more information).

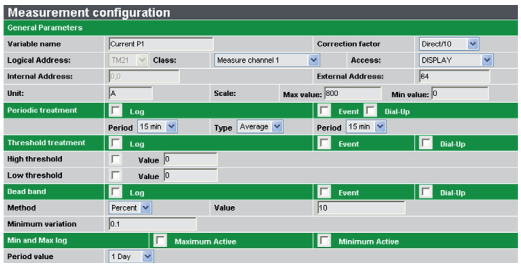
Variable addresses

All the variables can be configured with an external address.
This external address allows the variable to be made accessible in read or write mode from the supervisor by means of the protocol used for transmission.
A variable which has no address configured (address = "-") will not be accessible from the supervisor.
The values of the addresses configured depend on the type of protocol used.

Note: refer to the user manual for the protocol installed on the Flair 200C for more information concerning the addressing tables related to this protocol.

Flair 200C settings
Variable configuration (cont'd)

PE57549EN



Example of events configuration for a TM.
Configuration available in the "Settings ➡ Variable configuration" page and then by clicking on the variable name TMx

Saving variables

The Flair 200C includes a number of logs allowing archiving of events of various types (event log, alarm log, measurement log).
The logs can be accessed by the user via the embedded Web server ("Diagnostic" menu).
All the variables can be configured separately with or without being saved as a measurement (in the case of a measurement), event or alarm in these logs.
Note: the system log, for its part, does not take into account variable changes of status but rather information concerning the internal operation of the equipment.

When a variable is configured to be saved in a log, a specific symbol appears in the *Variable configuration* page on the same line as the variable:

= Saving to alarm log

= Saving to event log or to measurement log (in the case of a measurement).

Events associated with variables

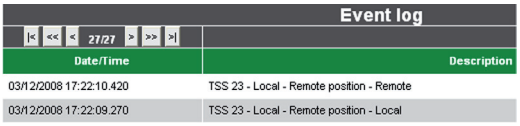
An event is generated by the Flair 200C when a change of status occurs on a variable. The Flair 200C manages two types of event tables associated with these changes of status:

■ **The local event table:** this is the event log that can be consulted locally on the Flair 200C. The changes of status concerning variables may be saved in this log or not, the aim being to have a history of changes of variables. For saving of a change of status on a variable to be effective, the variable must have been defined by configuration as an event ("save" (TM/CNT) or "activate saving" (TSS, TSD) box checked in the variable configuration page.

■ **The protocol event table:** this is an event stack for protocol exchange. This stack will be read by the supervisor during communications between the Flair 200C and the supervisor. Contrary to local events, it is not possible to configure a variable with or without saving in the protocol event stack. This is because any change of status on a variable automatically generates saving in this protocol event stack (except for TMs for which one can choose to configure event saving in the stack or not).

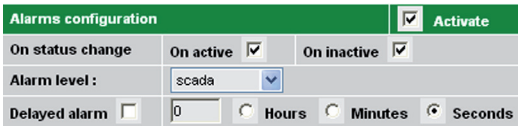
Flair 200C settings
Variable configuration (cont'd)

PE57550EN



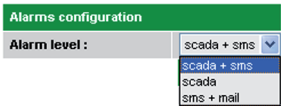
Example of saving in internal logs

PE57551EN



Configuration available in the "Settings ➡ Variable configuration" page and then by clicking on the name of the variable

PE57564EN



Choice of alarm level

Alarm reporting/Alarm acknowledgement

An alarm should be used for events which must be indicated rapidly to the supervisor, i.e. without waiting for interrogation by the supervisor (e.g. if the interrogation frequencies of the Scada system are rather spaced out over time).

The alarms are therefore valid only for non-permanent type transmission (e.g. PSTN, GSM, Radio), i.e. for types of transmission which require a deliberate interrogation action by the supervisor.

On a permanent connection (RS232, RS485, Ethernet, GPRS/3G*), it is therefore not necessary to use the remote alarm function because the retransmission of information between the Flair 200C and the supervisor theoretically takes place fairly regularly.

(*) Depending on the speed rate of the GPRS/3G network and/or its function mode, the link can be considered as non permanent and the alarm reporting is therefore used.

Note that the *"Alarm configuration"* section is displayed in the configuration page for the variable only if the protocol is configured as Master/Master.

Alarm levels

Three configurable access levels associated with an alarm allow definition of the various ways of processing calls during retransmission of an alarm:

- "scada" level: retransmission of the alarm by the protocol to the supervisor
- "scada + SMS" level: retransmission of the alarm by the protocol and by SMS
- "scada + mail" level: retransmission of the alarm by SMS and by e-mail to an operator on standby duty.

Call sequences triggering an alarm on a non-permanent link

On a non-permanent link, any change of status of a variable, if the latter has been configured to trigger an alarm, causes frames to be sent to the supervisor to inform it of the change of status that has occurred. At the same time, the Flair 200C saves the change of status information in the alarm log.

In PSTN or GSM, the Flair 200C attempts to join the supervisor three times on the main telephone number, then if this fails makes three further attempts on the standby telephone number. If the call still does not get through, the calls are stopped unless a new alarm occurs, which reinitiates the call sequence from the main number. The call sequences take into account the time delays configured in the "Protocol" page (refer to the Protocol manual for more details).

In radio mode, the Flair 200C attempts to send a frame over the radio network to the supervisor to retransmit the change of status information. If the call does not get through, the Flair 200C attempts to call the supervisor indefinitely without any restriction regarding the number of attempts. The call sequences take into account the time delays configured in the "Protocol" page. It is recommended not to configure excessively short time delays so as not to mobilize the radio network constantly (refer to the Protocol manual for more details).

In all cases, receipt of the event triggering an alarm by the Scada system causes acknowledgement of the alarm. If the alarm information does not reach the supervisor, no acknowledgement is performed. The acknowledgement of alarms by the Scada system can be checked in the "Alarm log" via the checked box opposite the alarm that has been acknowledged.

NB: this box is checked by the Flair 200C only for alarm retransmissions on non-permanent links. This is not managed for permanent links.

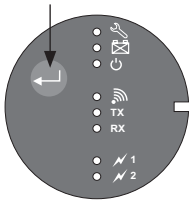
Note: the acknowledgement is internal to the Flair 200C and is the subject of no particular order from the supervisor in the frame destined for the Flair 200C.

Flair 200C settings
Variable configuration (cont'd)

Description of Flair 200C variables

Depending on the type of option chosen when buying the product (PowerMeter/local Modbus, etc.), some of the variables below may be not displayed in the configurator.

Push button on the front of the product



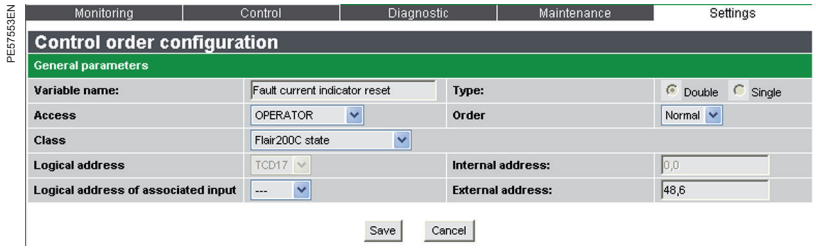
Class	Name	Type	Description
Equipment	Fault detection reset double command	TCD	Resets the fault detector and the external indicator terminal
	Voltage failure	TSS	If active, indicates LV voltage loss on the product
	Charger fault	TSS	The loader voltage is monitored constantly. It should be in a range between 4.4 and 4.9 V. When this operating range is exceeded, the "charger fault" variable appears on the local configurator and can be transmitted to the Scada system
	Battery fault	TSS	If active, indicates a battery problem. If the variable is active, the battery must be replaced
	Power cut imminent	TSS	When the Flair 200C is powered by the battery following a power cut, the variable indicates that the battery is reaching a threshold at which a power cut is imminent
	Battery disconnected	TSS	Indicates that the battery is disconnected from the product
	Battery low	TSS	Indicates that the battery voltage is low
	Communication test	TSS	A press on the push button on the front panel of the product triggers a sequence of calls to the supervisor. This variable allows monitoring of activation of the call sequence
Equipment measurements	Frequency	TM	Indicates the mains frequency
	Voltage measurement	TM	Indicates the MV voltage value
Channel x measurement	Current I1	TM	Current on phase 1
	Current I2	TM	Current on phase 2
	Current I3	TM	Current on phase 3
	Courant I0	TM	Residual current I0
	Average current 3I	TM	Average current flowing in the phases
	Power factor	TM	Calculation of power factor cos φ
	Active power	TM	Active power. The calculation is based on the LV voltage and current flowing in phase 1. Beware of the installation of toroids in the cubicle (see page 7)
	Reactive power	TM	Reactive power measured by the Flair 200C
	Apparent power	TM	Apparent power measured by the Flair 200C
	Active energy	CNT	Active energy measured by the Flair 200C
	Reactive energy	CNT	Reactive energy measured by the Flair 200C
Channel x fault	Earth fault	TSS	Indicates the presence of a permanent phase-to-earth fault on channel x (channel 1 or 2). The earth fault variable is activated if the I0 threshold is exceeded for a duration greater than the acknowledge time (adjustable value, see chapter on fault detection) and confirmed by voltage loss. This variable is also active if the ICC algorithm detects a fault (no adjustment necessary)
	Rapid earth fault	TSS	Indicates the presence of a rapid phase-to-earth fault on channel x (rapid fault = self-extinguishing fault or fault eliminated by the first closing cycle of the upstream protection device). The rapid earth fault variable is activated if the I0 threshold is exceeded for a duration less than the acknowledge time configured in the "Measurements/fault detector" page (70 ms by default) or if the fault is not confirmed by a voltage loss. This variable is not active in the case of ICC detection
	Rapid phase fault	TSS	Indicates the presence of a rapid phase fault. The rapid phase fault variable is activated if the Imax threshold is exceeded for a duration less than the acknowledge time configured in the "Measurements/fault detector" page (70 ms by default) or if the fault is not confirmed by a voltage loss
	Phase fault	TSS	Indicates the presence of a permanent phase-to-phase fault on channel x. The phase fault variable is activated if the Imax threshold is exceeded for a duration greater than the acknowledge time (adjustable value, see chapter on fault detection) and confirmed by voltage loss
	Backward current	TSS	With ICC detection only: this variable reports the presence of capacitive current on the line. The state of this variable can be sent to the SCADA for analysis but does not generate a fault indication (the outdoor light will not flash)
	Earth fault counter	CNT	Variable counting the number of permanent phase-to-earth faults
	Rapid earth fault counter	CNT	Variable counting the number of rapid phase-to-earth faults
	Rapid phase fault counter	CNT	Variable counting the number of rapid phase-to-phase faults
	Phase fault counter	CNT	Variable counting the number of permanent phase-to-phase faults
Temperature measurement	Interior temperature of enclosure	TM	Indicates the interior temperature of the enclosure
	Delta interior/exterior temperature	TM	Indicates the estimated temperature in the substation
Inputs	Digital inputs x	TSS	Digital inputs 1 to 6
Counter on inputs	Digital input x counter	CNT	Counter of each digital input
Digital outputs	Digital output x	TCD	Double command on digital output x. Each command will be seen as a double command from the supervisor. The activation of this double-bit command closes digital output x
	Digital output x	TSD	Status of the digital output. This status is seen as a TSD (double-bit) by the supervisor
Double digital outputs	Digital output 1-2	TCD	Double command on digital outputs 1 and 2. The activation of this double command closes digital outputs 1 and 2 (10 or 01 depending on the order sent)
	Digital input 1-2	TSD	Status of the digital inputs 1 and 2. This status is seen as a TSD (double-bit) from the supervisor

Flair 200C settings
Variable configuration (cont'd)

Configuration of telecommands TCL: single command or TCD: double command

By clicking on the name of a TCD type variable in the "*Settings* ➡ *Variable configuration*" page, one can obtain access to its settings.

Configuration of a TCD



General parameters

Parameter	Description
Variable name	Customization of the variable name
Type	Type of variable, Double or Single: Double by default for a TCD; Single by default for a TCL (unmodifiable)
Access	Defines the level of accessibility of this variable (administrator, operator, monitoring). The level of accessibility is defined with the login and password used for access to the Web server
Order	To reset the fault detector, the Flair 200C must receive a double command 0 ➡1. If the "reverse" order is selected, a double command 1 ➡ 0 received by the Flair will reset the fault detector
Class	Allows a variable to be associated with a defined class. It is advisable to group together those variables having an information link in the same class for easier reading in the pages of the Web server
Logical address	Logical address assigned to this variable by the Flair 200C. This is in fact the logical name of the variable (TCD+No.) (unmodifiable)
Internal address	Internal address assigned to this variable by the Flair 200C (unmodifiable)
Logical address of associated input	A TCD may be associated with a TSD. The Flair 200C automatically assigns the TSD that is associated with this variable if necessary
External address	Address providing access to this variable in read/write mode from the supervisor via the protocol. The address is specific to each protocol used (Modbus, IEC, DNP3). The Flair 200C includes as standard for each variable the configuration of the external addresses corresponding to the installed protocol. An address set to "-" is made inaccessible from the supervisor

Note: refer to the manual for the protocol which is installed on the Flair 200C for details concerning the external address tables.

Flair 200C settings
Variable configuration (cont'd)

Configuration of single telesignals (TSS)

By clicking on the name of a TSS type variable in the "*Settings* ➡ *Variable configuration" page*, one can obtain access to its settings.

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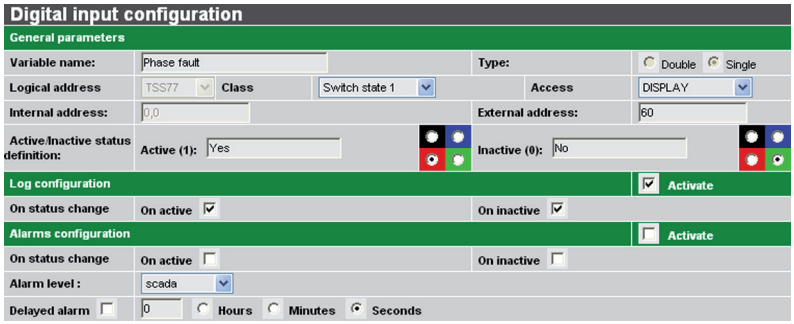

General parameters

Parameter	Description
Variable name	Customization of the variable name
Type	Type of variable, Double or Single: Single by default for a TSS (unmodifiable)
Logical address	Logical address assigned automatically to this variable by the Flair 200C. This is in fact the logical name of the variable (TSS+No.) (unmodifiable)
Class	Allows a variable to be associated with a defined class. It is advisable to group together those variables having the same information link in the same class for easier reading in the pages of the Web server
Access	Defines the level of accessibility of this variable (administrator, operator, monitoring). The level of accessibility is defined with the login and password used for access to the Web server
Internal address	Internal address assigned to this variable by the Flair 200C (unmodifiable)
External address	Address providing access to this variable in read/write mode from the supervisor via the protocol. The address is specific to each protocol used (Modbus, IEC, DNP3). The Flair 200C includes as standard for each variable the configuration of the external addresses corresponding to the installed protocol. An address set to "-" is made inaccessible from the supervisor
Active status definition	Allows definition of a text and a colour to be displayed in the *Monitoring* and *Control* pages to represent the active status of the variable (binary value 1)
Inactive status definition	Allows definition of a text and a colour to be displayed in the *Monitoring* and *Control* pages to represent the inactive status of the variable (binary value 0)

Note: refer to the manual for the protocol which is installed on the Flair 200C for details concerning the external address tables

Record configuration

By record is meant the saving of changes of status in the event log.

Parameter	Description
Activate check box	Check this box to activate saving of the variable in the event log according to the following configured criteria
On active	Check this box to save a change of status to active status of the variable in the event log
On inactive	Check this box to save a change of status to inactive status of the variable in the event log

Flair 200C settings
Variable configuration (cont'd)

Alarm configuration

By alarm is meant the saving of changes of status in the alarm log, but also:
- **In PSTN or GSM mode:** call sequence to the supervisor then retransmission of the alarm corresponding to the change of status.
- **In radio mode:** sending of a frame to the supervisor to retransmit the alarm corresponding to the change of status.

Comment: the alarms are not used on permanent links.
The following configuration should not be used for a permanent link.

Parameter	Description
Activate check box	Check this box to activate saving of the variable in the alarm log according to the following configured criteria
On active	Check this box to save a change of status to active status of the variable in the alarm log
On inactive	Check this box to save a change of status to inactive status of the variable in the alarm log
Alarm level	Three configurable levels corresponding to the various possibilities for alarm retransmission to the supervisor (see section on "Alarm reporting/ Alarm acknowledgement")
Delayed alarm check box	Check this box if the alarm is to be retransmitted to the supervisor only after a configurable time delay
Delayed alarm	Choice of the unit (hour, minute, second) and the waiting time before retransmission of the alarm

TSS test

The "TSS test" button at the bottom of the TSS configuration page allows the TSS to be made active (fictitiously) for a few seconds (10 seconds).
That makes it possible, for example, to perform testing of status retransmission to the supervisor, although without being obliged actually to generate the change of status for this TSS.

Configuration of double telesignals (TSD)

By clicking on the name of a TSD type variable in the "*Settings ➡ Variable configuration" page*, one can obtain access to its settings.

Note : the configuration is practically identical to that of a TSS. **We have noted in this section merely the differences between a TSD and a TSS.**

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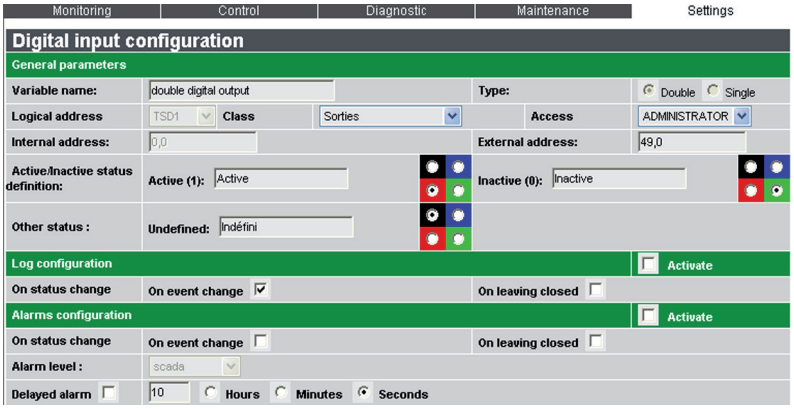

General parameters

Parameter	Description
Type	Type of variable, Double or Single: Double by default for a TSD (unmodifiable).
Other status	Allows definition of a text and a colour to be displayed in the *Monitoring* and *Control* pages to represent the undefined state of the variable

Record configuration

Parameter	Description
On status change	Check this box to save any change of state of the variable in the event log
On leaving close	Check this box to save the loss of the switch closed state (loss of the active state of the variable) in the event log

Alarm configuration

Parameter	Description
On status change	Check this box to save any change of state of the variable in the alarm log
On leaving close	Check this box to save the loss of the switch closed state (loss of the active state of the variable) in the alarm log

Flair 200C settings
Variable configuration (cont'd)

Telemeasurement (TM) configuration

By clicking on the name of a TM type variable in the *Settings* ➡ *Variable configuration* page, one can obtain access to its settings, namely:

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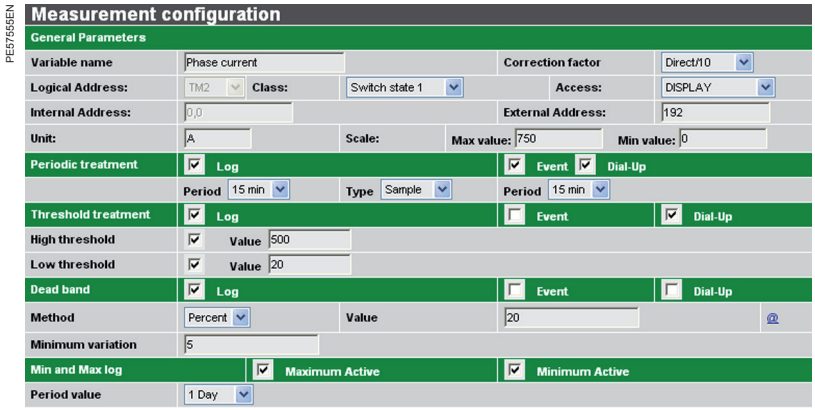


General parameters

Parameter	Description
Variable name	Customization of the variable name
Correction factor	Allows definition of a correction factor for display of the measurement in the Monitoring page. The default factors to be configured for each TM of a Flair 200C are as follows: ■ Phase current: Direct/10 ■ Mains voltage: Direct/10 Note: this factor does not change the format of the measurement sent in the protocol frame
Logical address	Logical address assigned to this variable by the Flair 200C. This is in fact the logical name of the variable (TM+No.) (unmodifiable)
Class	Allows a variable to be associated with a defined class. It is advisable to group together those variables having an information link in the same class for easier reading in the pages of the Web server
Access	Defines the level of accessibility of this variable (administrator, operator, monitoring). The level of accessibility is defined with the login and password used for access to the Web server
Internal address	Internal address assigned to this variable by the Flair 200C (unmodifiable)
External address	Address providing access to this variable in read/write mode from the supervisor via the protocol. The address is specific to each protocol used (Modbus, IEC, DNP3). The Flair 200C includes as standard for each variable the configuration of the external addresses corresponding to the installed protocol. An address set to "-" is made inaccessible from the supervisor
Unit	Unit to be associated with the measurement for display in the *Monitoring* page
Scale: Max. value	Should correspond to the maximum value that can be taken in practice by the measurement value. For *Raw* or *Normalized* type measurements, this Max. value is used for calculation during retransmission of the measurement to the Scada system or for display in the *Monitoring* page. (see note 2 below). ***NB:*** the value configured influences the precision of the measurement
Scale: Min. value	Doit correspondre à la valeur minimum que pourra prendre concrètement la valeur de la mesure. Pour des mesures de type *Brut* ou *Normalisé* cette valeur Min sert pour le calcul lors de la retransmission de la mesure au Scada ou pour l'affichage dans la page *Visualisation*. (voir nota 2 ci-dessous) ***NB:*** the value configured influences the precision of the measurement

Note 1: refer to the manual for the protocol which is installed on the Flair 200C for details concerning the external address tables.

Note 2: the Flair 200C manages the transmission of measurements to the Scada system and measurement display in the *Monitoring* page according to two formats:

■ Direct (or adjusted) value: corresponds to the real value in the reference unit (does not take into account the configured *Min.* and *Max. scale* values).

■ Raw (or normalized) value: corresponds to a value calculated and scaled in accordance with a formula taking into account the configured *Min.* and *Max. scale* values (see the protocol User Manual for details concerning measurement calculation).

The choice of *Direct* or *Raw* configuration is generally made in the *Protocol* page.

Flair 200C settings
Variable configuration (cont'd)

Regular processing

Parameter	Description
Log check box	Check this box to activate saving of the measurement in the measurement log according to the criteria configured below
Period	Can be used to choose the period for saving of the measurement in the measurement log
Type	Can be used to choose how to save the measurement: ■ *Averaged:* mean of measurements over the configured period ■ *Sampled:* instantaneous measurement at each configured period
Event check box	Check this box to activate saving of the measurement in the protocol event stack according to the period criterion configured below
Period	Can be used to choose the period for saving of the measurement in the protocol stack and/or the alarm log
Dial-up check box	Check this box to activate saving of the measurement in the alarm log and sending of a frame to the supervisor according to the period criterion configured above

Comment: the alarms are not used on permanent links.
The *Dial-up* check box should not be used for a permanent link.

Processing on threshold

Parameter	Description
Log check box	Check this box to activate saving of the measurement in the measurement log according to the criteria configured below
High threshold	Check the box to activate saving of the measurement upon exceeding the high threshold
High threshold value	Configure the high threshold value which will cause processing of the defined records
Low threshold	Check the box to activate saving of the measurement upon exceeding the low threshold
Low threshold value	Configure the low threshold value which will cause processing of the defined records
Event check box	Check this box to activate saving of the measurement in the protocol event stack according to the period criterion configured below
Dial-up check box	Check this box to activate saving of the measurement in the alarm log and sending of a frame to the supervisor according to the threshold criteria configured above

Comment: the alarms are not used on permanent links.
The *Dial-up* check box should not be used for a permanent link.
Note 1: same as for previous page.
Note 2: same as for previous page.

Dead band

Parameter	Description
Log check box	Check this box to activate saving of the measurement in the measurement log according to the % criterion configured below
Method	Fixed: a fixed change in the value of the variable results in an associated processing operation (saving, alarm). Percentage: a change in percentage of the variable results in an associated processing operation
Value	Configure the minimum percentage or the minimum measurement variation which will cause processing of the defined records
Minimum change	Whatever the method (fixed or percentage), a minimum change in the value of the TM is necessary for the variable to be processed (event, alarm, etc.)
Event check box	Check this box to activate saving of the measurement in the protocol event stack according to the % or change criterion configured above. (see notes 1 and 2 below)
Dial-up check box	Check this box to activate saving of the measurement in the alarm log and sending of a frame to the supervisor according to the % or change criterion configured above

Comment: the alarms are not used on permanent links.
The *Dial-up* check box should not be used for a permanent link.
Note 1: same as for previous page.
Note 2: same as for previous page.

Min. et Max. recording

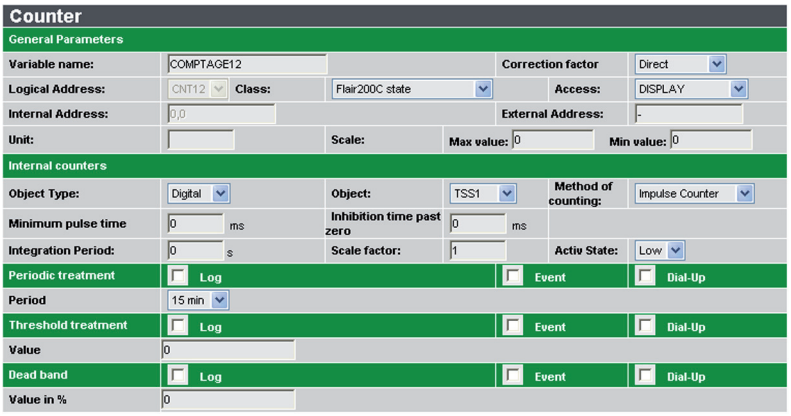
Parameter	Description
Maximum active check box	Check this box to activate saving in the measurement log of the maximum value reached in the period configured below
Minimum active check box	Check this box to activate saving in the measurement log of the minimum value reached in the period configured below
Period	Can be used to configure the period for saving of the measurement in the measurement log

Flair 200C settings
Variable configuration (cont'd)

Counter (CNT) configuration

By clicking on the name of a CNT type variable in the *Settings* → *Variable configuration* page, one can obtain access to its settings, namely:

PE57566EN



General parameters

Parameter	Description
Variable name	Customization of the variable name
Correction factor	Allows definition of a correction factor for display of the counter in the *Monitoring* page. ***Note:*** this factor does not change the format of the counter sent in the protocol frame. (default factor: *Direct*)
Logical address	Logical address assigned to this variable by the Flair 200C. This is in fact the logical name of the variable (CNT+No.) (unmodifiable)
Class	Allows a variable to be associated with a defined class. It is advisable to group together those variables having an information link in the same class for easier reading in the pages of the Web server
Access	Defines the level of accessibility of this variable (administrator, operator, monitoring). The level of accessibility is defined with the login and password used for access to the Web server
Internal address	Internal address assigned to this variable by the Flair 200C (unmodifiable)
External address	Address providing access to this variable in read/write mode from the supervisor via the protocol. The address is specific to each protocol used (Modbus, IEC, DNP3). The Flair 200C includes as standard for each variable the configuration of the external addresses corresponding to the installed protocol. An address set to "-" is made inaccessible from the supervisor
Unit	Unit to be associated with the counter for display in the *Monitoring* page. (By default: with no unit)
Scale: Max. value	Should correspond to the maximum value that can be taken in practice by the counter value. For *Raw* or *Normalized* type measurements, this Max. value is used for scaling of the display in the *Monitoring* page only (see note 2 below). ***NB:*** the value configured influences the precision of the counter
Scale: Min. value	Should correspond to the minimum value that can be taken in practice by the counter value. For *Raw* or *Normalized* type measurements, this Min. value is used for scaling of the display in the *Monitoring* page only (see note 2 below). ***NB:*** the value configured influences the precision of the counter

Note 1: refer to the manual for the protocol which is installed on the Flair 200C for details concerning the external address tables

Note 2: the Flair 200C manages measurement display in the *Monitoring* page according to two formats:

- Direct (or adjusted) value: corresponds to the real value in the reference unit (does not take into account the configured *Min. and Max. scale* values).
- Raw (or normalized) value: corresponds to a value calculated and scaled in accordance with a formula taking into account the configured *Min. and Max. scale* values (see the protocol User Manual for the calculation details).

The choice of *Direct* or *Adjusted* configuration is generally made in the *Protocol* page.

Flair 200C settings
Variable configuration (cont'd)

Internal counting

Parameter	Description
Object type	Selection of the variable type on which the counter is incremented (Digital or Analog)
Object	Name of the variable to which the counter is assigned
Method of counting	Depending on the type of object, the methods displayed are as follows: ■ For a DI type variable: □ impulse counter: the counter is incremented at each switchover of the variable to high state. □ hour counter: the Flair 200C calculates the period during which the variable is in the high or low state. The display in the viewing page is in the form "day,hour,minute,second". □ integrated counter: over a given range of time (integration period), the Flair 200C calculates the number of high states of the variable. For example, the integrated counter makes it possible to obtain a power from an energy counter having a pulse output. ■ For an AI/AO type variable: □ integration counter: the meter is incremented **each second** by the current value of the defined analog variable. For example, the Flair 200C can poll an analog variable (Power) from its Modbus Master port; the counter makes it possible to obtain the energy from the value of the power. □ average counter: the counter analyses an analog variable and displays the mean value of the variable over the configured integration period. This function allows smoothing of analogue variables in particular.
Minimum pulse time	Pulse length (in ms) after which the Flair 200C will consider a state as high
Inhibition time past zero	Period during which the Flair 200C inhibits pulse detection after zero crossing by the variable. This filter makes it possible to avoid possible rebounds in the event of a return to zero
Integration period	Useful period of the measurement in the case of an integrating meter (DI type variable) or mean (AI type variable)
Scale factor	Used in the case of a pulse counter. Weight of the pulse sent. With each pulse sent, the counter value is incremented in accordance with the conversion factor
Active state	Field used only in the case of a time counter State of the variable (high or low) which activates the time counter

Regular processing

Parameter	Description
Log check box	Check this box to activate saving of the counter in the measurement log according to the criterion configured below
Event check box	Check this box to activate saving of the counter in the protocol event stack according to the period criterion configured below
Period	Can be used to choose the period for saving of the counter in the measurement log and in the protocol stack to the supervisor

Processing on threshold

Parameter	Description
Log check box	Check this box to activate saving of the counter in the measurement log according to the value criterion configured below
Event check box	Check this box to activate saving of the counter in the protocol event stack according to the criterion configured below
Value	Configure the minimum value which will cause processing of the records defined above

Dead band

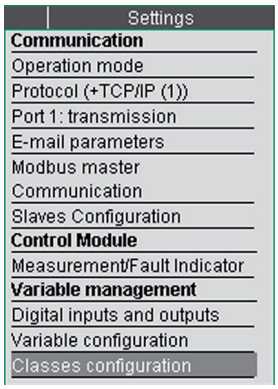
Parameter	Description
Log check box	Check this box to activate saving of the counter in the measurement log according to the % criterion configured below
Event check box	Check this box to activate saving of the counter in the protocol event stack according to the criterion configured below
Value as %	Configure the minimum counter variation percentage which will cause processing of the records defined above

Note 1: same as for previous page.

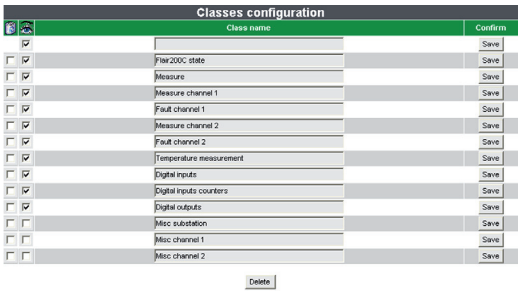
Note 2: same as for previous page.

Flair 200C settings
Classes configuration

PE57815EN



PE57558EN



"Classes configuration" page

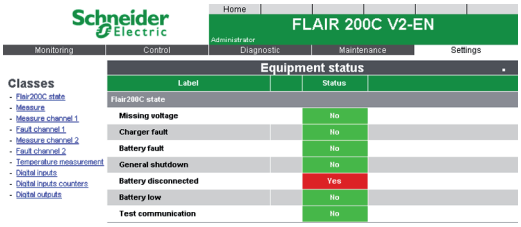
PE57559EN

Creation of a new class

PE57560

"Deletion" and "Monitoring" check boxes

PE57561EN



Example of variables associated with a class
Excerpted from the "Monitoring" page

Classes configuration Page

Access: ***Settings*** ➟ ***Classes configuration*** menu

Definition of classes

A class allows the Flair 200C variables to be grouped in various categories in the monitoring and control pages of the Web server (e.g. *Monitoring* and *Control* pages), so as to make the data display clearer.
Note: the variable configuration page also adopts the same organization of variables by class.

Classes configuration

The factory configuration settings of the Flair 200C include by default a number of classes. However, it is possible to modify this configuration to customize the display of the variables in the pages.
The *Settings* ➟ *Classes configuration* page can be used to create a new class, or to modify or delete an existing class.

Creating a class

To create a new class, simply enter its name in the empty *Class name* field and click on the associated *Save* button.

Once the class has been created, it is then possible to configure a variable of the Flair 200C to be attached to that class (see chapter on "Customization of Flair 200C variables").

Modifying a class

Modification concerns only the change of class name or the possibility of making a class visible or invisible in the pages of the Web server.

To modify the name of a class, simply change the title in the class entry field and click on the associated *Save* button.

A specific check box can be used to define whether a class and the variables associated with that class will be visible in the monitoring pages (*Monitoring* and *Control* pages).

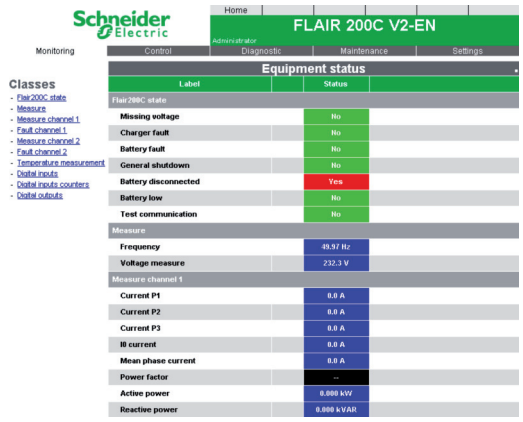
Selection of this check box and a click on the *Save* button makes the class visible in the pages (and conversely for deselection).

Deleting a class

A specific check box in the page can be used to delete an existing class.
Selection of this check box and a click on the *Delete* button permanently erases the selected class.
Note: it is not possible to erase a class if variables are still attached to that class.

General

PE57506EN



The equipment does not require regular maintenance.
The integrated battery test keeps users informed of the battery's availability status.

The Flair 200C has certain tools to perform maintenance or fault finding on the equipment.
This requires a PC-compatible microcomputer with Internet Explorer (or an equivalent software) installed. It is then possible to read the internal states of the equipment and the events stored in memory by the Flair 200C.

The tools available for maintenance and fault finding are as follows:

Monitoring Page

The left-hand screen shows an example of a 2-channel Flair 200C. This menu allows viewing of all the states and information managed by the Flair 200C:
- Battery status
- Stored fault currents: *Imax* and *Imax transient* on each phase
- Current measurement on each phase, average current and neutral current
- Voltage measurement
- Power measurement, active, reactive and apparent
- Etc.

Comment: the indications are refreshed every second.

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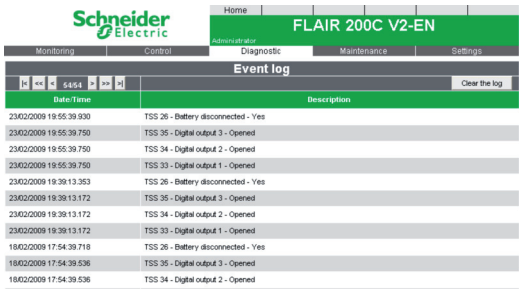


Consulting the logs

The various logs available (events, alarms and system) make it possible to know the history of everything that has occurred on the Flair 200C.
This can be useful to find the cause of a fault during fault finding.
- All the events displayed in the logs are time stamped so as to know the date of origin of a fault.
- Given the large number of time-stamped events saved, it is possible to go back sufficiently far in time to trace the cause of a problem.

When the maximum number is exceeded, the oldest event on the list is erased by the most recent one.
- The logs can be saved on PC in the form of Excel-compatible files so as to be able to perform fault finding, reviews or statistics later.
- The logs can be transferred by e-mail so as to be able to forward the report on a problem to an accessory department or person or possibly to exchange an opinion with the manufacturer of the Flair 200C.

Control and indicator lamps

The Flair 200C can be operated either locally or remotely from a supervisor.

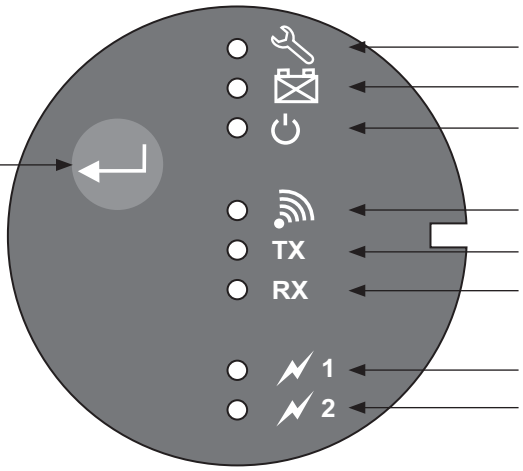
In local mode, Leds on the front panel of the enclosure provide information on the status of the equipment and indicate any presence of a fault on the line.

To have further information on the status of the Flair 200C and the history of its operation, it is possible to log on via a microcomputer to consult the logs or the *Monitoring* page and determine the cause of a fault precisely.

Control

Push button:
- TEST: triggers a call to the Scada
- RESET of fault detection if a fault is present (lit red)

DE58897



Indicator lamps
- Equipment fault
- Battery fault
- LV voltage:
  - Absent (red Led)
  - Present (green Led)
- GSM connection status
- Data sent
- Data received
- Permanent phase or earth fault on channel 1
- Permanent phase or earth fault on channel 2

Diagnostics - Power supplies

Diagnostics via the indicator lamps and logs

A diagnostic through the status of the indicator lamps on the front panel is not always adequate to find the cause of a fault. A lit indicator lamp indicates the presence of a fault, but it is often necessary to consult the logs or the *Monitoring* page to determine precisely the cause of a fault.

Symptoms	Possible causes	Solutions	Logs
The "Equipment fault" Led is lit (you are advised to connect a PC to determine the cause of the fault: "Monitoring" Page)	The battery charger output voltage is too high or too low	Check the battery. If necessary, change the battery. Consult the event log, and if the *charger fault* information is shown, contact your distributor	Charger fault
	Communication medium configuration problem	Connect the PC to the product and consult the logs. **Configuration loss: reconfigure the Flair 200C** with the offline configurator supplied with the CD. **Other faults:** check configuration conformity (PIN number entered, etc.). If the fault persists, contact your distributor	Interface or modem initialization error
	Internal communication problem	Internal communication between the two cards of the Flair 200C does not take place correctly. Contact your distributor	No measurement card
The "AC supply OFF" Led is lit red	No supply to the enclosure	Connect the AC supply	
	Temporary AC supply outage	Wait for the AC supply voltage to be reinstated (the product is now running on battery)	Power supply failure
	The Flair 200C power supply card is damaged	Contact your distributor	
The "Battery problem" Led remains lit	Battery not connected or absent	Connect the battery	
The "Battery problem" Led flashes at regular intervals (500 ms on/500 ms off)	The battery voltage is low	Recharge the battery by powering the Flair 200C with the LV voltage	
The "Battery problem" Led flashes twice at regular intervals (120 ms on/120 ms off/ 120 ms on/640 ms off)	The battery is no longer operating	Change the battery	
The GSM signal Led is lit	GSM connection	See chapter on "Settings" (GSM section) for further information	

Power supplies

Powering down the equipment:

- **Switch off the AC supply**. Open the cubicle (certified IP2x).
- **Disconnect the connector** for the main power supply and the battery.

Following these two operations, all the Leds on the front panels should be extinguished.

Toroid safety precautions
The toroid connectors are IP2x; switching off the current sensors temporarily (< 10 min) involves no particular danger.

IMPORTANT NOTE:
- **Use batteries having recent production dates (less than three months' old).**
- **Do not store more than six months without recharging.**
- **Do not throw the batteries away.**

Battery maintenance

Replacing the battery
Before carrying out any work on the battery, disconnect it from the equipment by unplugging the connector from the base. Cut the clip that holds it.
To install a new battery, repeat this sequence in the reverse order.

Servicing and storing the batteries
Sealed spiral lead batteries are used. The advantages of this type of battery include the fact that there is no risk of explosion, no acid leakage and no servicing requirement.

However, this type of battery has its limitations:
- Limited number of recharging cycles
- Average service life of 10 years, with ageing accelerated by temperatures outside the recommended range
- Ageing during storage (do not store for more than 6 months without recharging, as this type of battery does not withstand a total discharge)
- Difficult to predict the end of battery service life
- The Power Supply module is designed to optimize the characteristics of the battery. A battery fault alarm informs the remote control system of an imminent discharge.

Configuration parameters

Definition of access levels according to the patterns in each box in the table:

- White colour: accessible or modifiable as **User**, **Operator** or **Administrator**
- Yellow (or light grey) colour: accessible or modifiable only as **Operator** or **Administrator**
- Green (or medium grey) colour: accessible or modifiable only as **Administrator**
- Dark grey colour: not accessible or non-existent

Home Page

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
		Home		Back to home page
		Local/Remote	Local/Remote	Local: normal access. Remote: simplified access (images and logos not loaded)
	Choice of language	Language	Français/English/Português/ Español/Deutsch	
	User	User name	No restriction	Confirmation by OK (by default: *Easergy*)
		Password	No restriction	Confirmation by OK An incorrect user or password opens a *User* session (by default: *Easergy*)

Monitoring Page

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
	Classes	Equipment		Access to the corresponding class states
		Equipment measurements		Access to the corresponding class states
		Channel x measurements		Access to the corresponding class states
		Channel x faults		Access to the corresponding class states
		Temperature measurement		Access to the corresponding class states
		Inputs		Access to the corresponding class states
		Counters on inputs		Access to the corresponding class states
		Outputs		Access to the corresponding class states

Control Page

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
	Equipment	Active/Inactive		Resets the fault detector
	Channel x measurements	Active/reactive energy preset		Allows the active/reactive energy counter value to be changed
	Channel x faults	Fault counter preset		Allows the fault counter value to be changed
	Counter on inputs	Counter on inputs preset		Allows the counter on inputs value to be changed
	Outputs	Active/Inactive		Allows the physical outputs of the Flair 200C to be activated/ deactivated

Diagnostic Menu

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
Alarm log		Clear log		The *Ack* box is checked when the Scada system is waiting for acknowledgement The *Clear log* button clears the log's content
Event log		Clear log		The *Clear log* button clears the log's content
System log		Clear log		The *Clear log* button clears the log's content
Measurement log		Clear log		The *Clear log* button clears the log's content
File transfer		Alarms.csv		Transfers the alarm log in Excel file form *Save* saves the file to the PC *Open* opens the file under Excel
		Events.csv		Same as for the events log
		System.csv		Same as for the system log
		Measures.csv		Same as for the measurement log

Maintenance Menu

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
Terminal	General	Name of terminal	No restriction	At the user's choice
		Date format	DD/MM/YYYY MM/DD/YYYY YYYY/MM/DD	Defines the date format to be displayed in the logs
		Date/time of last configuration		Consultation exclusively
		Configurator structure version		Consultation exclusively
		Area comment	No restriction	At the user's choice

Configuration parameters (cont'd)

Software	Software information	All displayed parameters		Name of software, version, date and time of compilation, type of compression, size, CRC32. Consultation exclusively
		Software 1	Checked or not	Selection of software 1
		Software 2	Checked or not	Selection of software 2
		Download software		Allows the Flair 200C software to be updated
Clock	Terminal date/time	Date	Consistent date format (year > 2000)	
		Time	Consistent time format	
		Update		Allows the Flair 200C date and time to be updated manually
		Synchronization		Allows the Flair 200C date and time to be updated automatically by the PC
		Time zone	All existing time zones	By adjusting the time zone, the Flair will automatically change its clock upon a summer/winter time transition
		SNTP server address	No restriction	IP address of an SNTP server for time synchronization by SNTP protocol
		Polling period	Between 1 and 120 s	Time between each sending, by the Flair 200C, of a time synchronization frame to the SNTP server
		Last SNTP synchronization		Displays the time of the last SNTP synchronization performed
IP parameters	Interface Ethernet	Mac address		Unique identification address for each Flair 200C, set in factory. Consultation exclusively
		DHCP	Active Inactive	Defines whether the server of the Ethernet local area network can assign automatically on connection an IP address to the Flair 200C (active) or not (inactive)
		IP address	Consistent IP address	Ethernet IP address of the Flair 200C (by default: 172.16.0.5)
		Sub-network mask	Consistent mask	The mask enables (0) or inhibits (255) the choice of accessible IP address values (by default: 255.255.255.0)
		Gateway addresses	Consistent IP address	IP address of the server's Ethernet gateway. The gateway centralizes all the network IP accesses (by default: 172.16.0.1)
		Primary DNS server	Consistent IP address	IP address of the primary DNS server (Domain Name Server). The DNS enables the IP addresses to be associated with the website names (by default: 172.16.0.1)
		Secondary DNS server	Consistent IP address	IP address of the secondary DNS server (Domain Name Server). Backup DNS server (by default: 0.0.0.0)
	USB interface	Server IP address		IP address assigned to the Flair 200C's embedded Web server for USB port. Unmodifiable (by default: 212.1.1.10)
		Client IP address		IP address assigned to the PC connected via USB to the embedded Web server. Unmodifiable (by default: 212.1.1.11)
	Communication interface	Server IP address		IP address assigned to the Flair 200C's embedded Web server by the GPRS network operator. Unmodifiable
		Client IP address		IP address assigned by the GPRS network operator to the client (supervisor) which will log on to the Flair 200C Web server. Unmodifiable
		Save / Cancel		Allows changes to be saved/cancelled
IP server port	TCP services	HTTP server port	Valid port number	Port number for the HTTP server of the Flair 200C (by default: 80). Any change of port No. implies indication with the IP address (e.g. 10.207.154.240:1500 for access with a port No. = 1500)
		Telnet server port	Valid port number	Port number for the Telnet server of the Flair 200C (by default: 23)
		Port 1 trace server port	Valid port number	Port number for the port 1 trace server of the Flair 200C (by default: 1168)
		TCP/IP trace server port	Valid port number	Port number for the TCP/IP trace server of the Flair 200C (by default: 1170)
		Save		Allows changes to be saved
User		User name	No restriction	User name for the session
		Password	No restriction	Password for the session
		Type	Administrator Operator	The Administrator has full access The Operator has restricted access
		Save		Saves changes
		Recycle bin		Check box to select a session to be deleted
		Delete		Deletes an existing session if the corresponding box is checked
Port 1 and TCP/IP traces	Trace options	Start / Stop		Start/Stop frame motion PC – Flair 200C
		Erase		Erases the content of the trace
Save/ Restore	Saves the terminal configuration	Flair 200C ➡ PC arrow		Allows the configuration to be saved on the PC in file form
	Loads the terminal configuration	PC ➡ Flair 200C arrow		Enables the configuration to be loaded on the PC from a file

Configuration parameters (cont'd)

Settings Menu

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
Operating modes General communication parameters	Communication parameters on physical ports	Port 1 mode	Depends on the protocol: ■ IEC: Asymmetric or symmetric mode ■ Modbus: Report by exception or No report by exception ***Note:*** for DNP3, the *sollicited* or *unsollicited* mode is to be declared in the *Protocol* menu	Definition of transmission mode to be used: ■ Without alarms: *Asymmetric* or *No report by exception* ■ With alarms: *Symmetric* or *Report by exception*
		Port 1 link	Not used Normal Test	■ Channel not available ■ **Main transmission channel** ■ (in radio mode only). Allows a fixed frequency to be generated on the radio network for antenna installation adjustment operations or level measurements on fields received on another Flair 200C within range of the first.
		Port 1 medium	Direct RS232 (internal) Radio (external) 600/1200 FSK Radio (internal) PSTN (external) 1200/2400 FFSK (internal) PSTN (internal) GSM (external) GSM (internal) GPRS (internal)	■ Integral RS232 modem ■ For external radio with integral modem ■ Integral FSK radio modem ■ For external PSTN modem accessible by Hayes command ■ Integral FFSK radio modem ■ Integral internal PSTN modem ■ For external GSM modem accessible by Hayes command ■ Integral GSM modem ■ Integral GPRS modem
	Communication parameters on TCP/IP ports	TCP/IP port link	Not used Normal	■ Channel not available ■ **Channel used for transmission to the supervisor via the Ethernet interface on condition that the protocol supports this transmission mode**
		Save		Allows the configuration to be acknowledged
Protocol				Refer to the User Manual for the protocol used for more information concerning this configuration
TCP/IP protocol				Refer to the User Manual for the protocol used for more information concerning this configuration
Port 1 : Transmission	Direct RS232 or Radio or PSTN or GSM or LL	Transmission speed	■ 200 to 38400 baud ■ 600 and 1200 baud only in FSK radio or FSK LL mode ■ 1200 and 2400 baud only in FFSK radio mode	Frame transmission rate
		Parity	None Space Even Odd	Transmission parity
		Stop bits	1 or 2	Stop bit in frame
		Frame error on noisy start	Yes or no	The start of the frame can be filtered or not to avoid reading any noise
		Frame error on idle interval	Yes or no	Any holes in the frame can be filtered or not
		Delay before response	0 to 10000 ms	In 10 ms increments. Upon reception, wait before sending the response to avoid frame overlapping (by default: 0 ms))
		Handle DTR	Checked or not	Data Terminal Ready. DTR is used by the Flair 200C to indicate that it is ready for transmission
		DTR to RTS delay	0 to 10000 ms	In 10 ms increments. Time delay to be complied with between rising of the DTR and RTS signals. In external radio, this corresponds to the time delay between the send order and carrier rise. (By default: 0 ms)
		Handle RTS	Checked or not	Request To Send. If this option is selected, the RTS signal will be managed during transmission exchanges with the modem
		Handle CTS	Checked or not	Clear To Send. The modem enables the CTS as soon as ready after RTS enabling by the Flair 200C
		RTS to CTS delay	10 to 10000 ms	In 10 ms increments. Time delay between receiving the RTS and sending the CTS by the modem (by default: 20 ms)
		RTS (or CTS) to message delay	0 to 1000 ms	In 10 ms increments. Delay between rise of RTS (or CTS if managed) and sending the message
		Message to RTS delay	0 to 10000 ms	In 10 ms increments. Time delay between the end of the message and RTS falling by the Flair 200C (by default: 20 ms)
		Handle DTR	Checked or not	Data Terminal Ready. The modem causes the DTR to rise after powering up or when it is Clear To Send
		Handle DCD	Checked or not	Data Carrier Detect. The carrier can be used by the modem to detect reception of a message
	LL	Type of line	2-wire or 4-wire	Choice of type of leased line used

Configuration parameters (cont'd)

	PSTN or GSM	Caller communication delay	1 to 600 s	Allows the call to be released when the Flair 200C is called after the configured time delay (by default: 30 s)
		Called communication delay	1 to 600 s	Allows the call to be released when the Scada system is called after the configured time delay (by default: 60 s)
		Telephone No. (main)	0 to 9, P, T or space	Main telephone No. to be used in case of alarm retransmission
		Telephone No. (standby)	0 to 9, P, T or space	Standby telephone No. to be used in case of alarm retransmission if main No. cannot be reached
		Modem init. sequence	No restriction. Record consistent AT commands	AT commands necessary to initialize the PSTN modem. With internal PSTN mode, default AT commands unmodifiable (by default: &F0%S0=12S0=1&K0%C0E0&W0&Y0)
	PSTN	Type of dialling	Pulse or voice frequency	Type of dialling used for alarm retransmission
	GSM	PIN number	0000 to 9999	PIN number of the GSM card
		SMS service centre No.	0 to 9, P, T or space	Telephone No. of the SMS service centre (gateway for SMSs)
		User SMS No.	0 to 9, P, T or space	Telephone No. of the user for sending SMSs
	RS485	Polarization	Checked or not	If the box is checked, allows the line of the RS485 network to be polarised on the Flair 200C side. The RS485 line must be polarised, commonly on the master side
		End of line resistance	Checked or not	If the box is checked, activate the load resistance of the RS485 network on the Flair 200C side. The RS485 line must be loaded on each side of the line.
		Line type	2 wires or 4 wires	Type of transmission used: 2 wires or 4 wires
	GPRS	Access Point Name	No restriction	Name of the GPRS access point provided by the GPRS network operator
		PIN number	0000 to 9999	PIN number of the SIM card
		Daily disconnect	Checked or not checked	Override setting of automatic disconnection/reconnection of the Flair 200C to the GPRS network at a fixed time. In the event of loss of connection with the network, this process allows the Flair 200C to reconnect, because it cannot do so by itself autonomously.
		Disconnection time	0 to 23	Configuration of the selected daily disconnection time according to the criteria described in *Daily disconnect*.
		Specific Ping IP Address	Consistent IP address e.g.: 192.168.2.169	The ping makes it possible to verify and measure the quality of the equipment's connection with another device connected to the Ethernet network. Enter the known IP address of another device capable of receiving the packet corresponding to the ping allowing this quality to be measured.
		Ping test		Button that can be used to set the ping test manually to verify Flair 200C connection to the GPRS network. The Flair 200C then displays the result of the test: *Ping OK* or *Ping failed*
		Authentication	Checked or not checked	When the GPRS network requires authentication in the connection phase, activate this function by checking the box. Encryption protocols accepted: PAP, CHAP, MSCHAP, MSCHAP V2
		Login	No restriction	Configuration of the login used for authentication. Configure this field only if the *Authentication* option has been checked.
		Password	No restriction	Configuration of the password used for authentication. Configure this field only if the *Authentication* option has been checked.
		Save		Allows the configuration to be acknowledged
E-mail parameters	E-mail configuration	Recipients e-mails	3 recipients maximum	Enter the e-mail of the recipients. At most three recipients can be entered per level (separated by a ; no space between them)
	SMTP parameters	SMTP server address		Address of the SMTP server. This address can be defined in the form of an IP address (e.g.: 80.45.2.58) or a domain name (e.g.: smtp.free.fr). Where a domain name is used, make sure to configure the address of the DNS server correctly (Maintenance/IP parameters menu)
		SMTP server port		Port associated with the remote SMTP server. By default, the SMTP protocol is defined on port 25. However, this port can be changed
		User e-mail		Corresponds to the "from" field of the e-mails sent. With certain Internet service providers, this field must be that given by your ISP. It is declared on their SMTP server.
		Sending support	GSM / GPRS / Ethernet	Choice of sending medium
	PPP connection	Call number		Telephone number of the ISP access point
		Login		User name. Provided by the ISP
		Password		Password needed to establish the PPP connection. Provided by the ISP

Configuration parameters (cont'd)

Settings Menu (cont'd)

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
Measurements/ fault detector		Mains frequency	50 or 60 Hz	Choice of mains frequency (by default: 50 Hz)
	Voltage measurement configuration	Transformation ratio	100 to 36000 V/ 90 to 270 V	Transformation ratio of the VT powering the Flair 200C
		Transformer phase shift	0 to 11 h	Phase shift, in hours, introduced by the VT powering the Flair 200C. Essential for power measurement
		Nominal voltage	From 20 to 36000 V	Nominal voltage of the MV line
	Voltage monitoring configuration	Voltage present threshold	70% to 120%	Minimum threshold for validation of power on
		Voltage absent threshold	5% to 95%	Maximum threshold for acknowledging voltage absence
		Time delay for acknowledgment (Absence/Presence)	From 20 to 800 ms (in increments of 10 ms)	Time delay for acknowledging voltage loss or return
	Current measurement configuration	Configuration of current sensors	I1, I3, I0 or I1, I2, I3	Choice of type of toroid setup: 3 phase toroids or 2 phase toroids + 1 homopolar
		Types of phase toroids	MF1/MFD, SOR97200 =S=, 2200/1, 500/1, other types (in that case, enter the number of turns)	Types of phase toroids used
		Number of phase toroid turns	Between 50 and 2500 turns	If the type of toroid is *other*, enter the number of phase toroid turns
		Types of zero sequence toroids	MFH, SOR99120 =S=, 2200/1, 500/1, other types (in that case, enter the number of turns)	Types of zero sequence toroids used
		Number of zero sequence toroid turns	Between 50 and 2500 turns	If the type of toroid is *other*, enter the number of homopolar toroid turns
	Fault detection configuration Ammetric detection	Types of fault detection	■ Ammetric ■ ICC ■ None	Choice of earth fault detection: ■ Ammetric type ■ None: the Flair merely performs monitoring (calculation of currents, voltage, etc.) ■ ICC: detection of the ICC type (see following chapter) is possible only if the Flair 200C has been bought with the *ICC* option)
		Network presence	■ By current ■ By voltage	A fault on the network is confirmed by a voltage loss. Choice of the type of network presence/absence indication for confirmation of the fault: indication by the presence/absence of LV voltage or by the presence/absence of current flowing in the toroids
		Inetwork powered		Only if network presence by current is selected. This field is calculated automatically from the *Inetwork not powered* field. For a line current greater than this current, the Flair 200C indicates a network presence
		Inetwork not powered		This field is useful when network absence by current is selected. However, this Inetwork not powered is verified even if network presence by voltage is selected. For a line current smaller than this current, the Flair 200C indicates a network absence. Make sure that the current entered is greater than the capacitive currents
		Network absence time after Iphase fault		Time after which the network is considered as absent (by current or by voltage) following a fault
		Iphase fault current threshold		Imax fault current detection threshold
		Fault current threshold I0	Between 2 and 160 A	Homopolar fault current detection threshold
		Iphase acknowledge time	Between 40 and 800 ms	*Phase Imax* fault filtering time. Any fault greater than Imax and of a duration exceeding this time will be acknowledged by the Flair 200C
		I0 acknowledge time	Between 20 and 800 ms	*Homopolar I0* fault filtering time. Any fault greater than I0 and of a duration exceeding this time will be acknowledged by the Flair 200C
		Reset upon network return	Box checked or not	Reset (if checked) or not of the fault detection indication stored in memory upon network return.
		Transient filtering time after fault		Unmodifiable. Following detection of a first fault, a filtering time delay is activated. The new transient or rapid faults will then not be acknowledged during the filtering period. This limits the number of transient fault signals (e.g. reactivating faults not seen by the upstream protection, for example).
		Inrush	Set in factory at 3 s	Temporarily inhibits fault detection upon voltage return
		Confirmation time delay	Set in factory at 70 s	Waiting time for a network absence (by current or voltage) after exceeding the Imax or I0 current. This is a time delay for confirmation of the fault
		Detector reset time delay	Between 1 and 12 h	Maximum time delay for indication of a current fault. After this time, the fault is automatically erased

Configuration parameters (cont'd)

	ICC detection	Current presence threshold	Between 2 and 20 A	For a line current greater than this current for a period exceeding the *Current presence time*, the Flair 200C will confirm a network presence
		Current absence threshold	Between 2 and 20 A	For a line current less than this current for a period exceeding the *Current absence time*, the Flair 200C will confirm a network absence
		Current presence time	Between 40 and 800 ms	Confirmation time for the detection of network presence
		Current absence time	Between 40 and 800 ms	Confirmation time for the detection of network absence
		Iphase fault current threshold	Between 40 and 800 A	For phase fault detection, ammetric type detection is used (see preceding chapter). This field corresponds to the detection threshold Imax
		I0 fault current threshold	Between 2 A and 160 A	Threshold for detection of homopolar current
		Iphase acknowledge time	Between 40 and 800 ms	*Phase Imax* fault filtering time. Any fault greater than Imax and of a duration exceeding this time will be acknowledged by the Flair 200C
		Operation with sustained fault confirmed	Checked or not	Check the box if a fault does not cause opening of the upstream circuit breaker and if operation takes place on the remaining 2 phases
		Minimum current	Between 2 and 20 A	Operation with sustained fault is authorized only for a residual current greater than this value after the fault. When the residual current value returns below this threshold, the fault indication is reset
		Acknowledge time	Between 1 and 100 s	Sustained fault filtering time. Any fault greater than the minimum current and of a duration exceeding this time will be acknowledged by the Flair 200C
		Network time without fault	Between 1 and 10 s	In the event of a network return, period during which no fault should appear on the line in order to stop fault indication and return to healthy operation
		Save		Allows the configuration to be acknowledged
Digital input/output configuration	Digital input configuration	Digital input x	FPI input Standard input	The internal variable goes to 1 when the digital input is active. The internal variable goes to 1 when the digital input is active and causes the external indicator terminal (external lamp) to flash
	Digital output configuration	Digital output x position	Pulse Standard Double	■ Activation of the command generates on the output a pulse of configurable duration (see below). ■ The output is maintained when the associated variable (TCL command) goes to 1 ■ A switch type order (2 bits) is applied on outputs 1 and 2
		Pulse duration	Between 50 ms and 5 s	When a pulse type output is selected: period during which the digital output will be active when transmitting a command
	Double input configuration	TSD control before execute	Checked or not	If the box is checked, the Flair 200C checks the consistency of the digital inputs if the box "TSD control before execute" is checked
		Return position waiting time	1000 to 60 000 ms	In 100 ms increments. Waiting time for change of switch position following an order, before sending a telecontrol fault. (By default: 15000 ms)
		Non-complementary filtering time delay	1000 to 30 000 ms	In 100 ms increments. Waiting time for non-complementarity following a loss of switch state before sending a position fault (by default: 10000 ms)
		Operating time	50 to 60 000 ms	In 50 ms increments. Control relay rise time. (by default: 2200 ms)

Configuration parameters (cont'd)

Settings Menu (cont'd)

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
Variable configuration Control configuration	General parameters	Variable name	No restriction	Name given to variable
		Type	Single or double	TCL = single command, TCD = double command
		Access	Administrator Operator Monitoring	Access right for this variable. The variable will be readable or modifiable depending on the type of access configured and the associated access rights
		Order	Reverse or normal	The reverse choice reverses the order of the control bits for the TCD in the protocol frame to the supervisor. Example: TCD on normal: 0 ➡ 1 causes resetting of the fault detector TCD on reverse: 1 ➡ 0 causes resetting of the fault detector
		Class	(Complete list of all classes defined)	Allows a variable to be assigned to an existing class
		Logical address		Internal No. of the variable assigned automatically by the Flair 200C (unmodifiable)
		Internal address		Internal address (unmodifiable)
		Associated logical address TS	TSD1 to TSD40 or none	No. of the TSD associated with the TCD used by the Flair 200C for reading the status
		External address	Format "x" (e.g.: 1) for all protocols except: ■ Modbus: "x,x" (word, bit) ■ DNP3: "x,x" (word, class)	External address used for retransmission of the variable in the protocol link to the supervisor
		Save		Allows the configuration to be acknowledged
		Cancel		Enables return to the preceding configuration
Variable configuration Indications configuration	General parameters	Variable name	No restriction	Name given to variable
		Type	Single or double	TSS = single information, TSD = double information
		Logical address		Internal No. of the TSS assigned automatically by the Flair 200C (unmodifiable)
		Class	(Complete list of all classes)	Allows a variable to be assigned to an existing class
		Access	Administrator Operator Monitoring	Access right for this variable. The variable will be readable or modifiable depending on the type of access configured and the associated access rights
		Internal address		Internal address (unmodifiable)
		External address	Format "x" (e.g.: 1) for all protocols except: ■ Modbus: "x,x" (word, bit) ■ DNP3: "x,x" (word, class)	External address used by Scada for this variable
		Status definition: Active (1)	No restriction	Name displayed for an active status of the variable
		Status colour: Active (1)	Black, blue, green or red colour	Display colour for an active status of the variable
		Status definition: Inactive (0)	No restriction	Name displayed for an inactive status of the variable
		Status colour: Inactive (0)	Black, blue, green or red colour	Display colour for an inactive status of the variable
		Other status: Undefined	No restriction	Name displayed for an undefined status of the variable (only with TSD and not with TSS)
		Status colour: Undefined	Black, blue, green or red colour	Display colour for an undefined status of the variable (only with TSD and not with TSS)
	Record configuration	Enable	Checked or not	Enabling of the record or not upon change of status of this variable in the event log
		Upon any change of status (TSD) or upon active (TSS)	Checked or not	Saving of the event upon any change of status of the variable (TSD) or upon appearance of the active status (TSS)
		Upon loss of closing (TSD) or upon inactive (TSS)	Checked or not	Saving of the event upon disappearance of the closed status of the variable (TSD) or upon appearance of the inactive status (TSS)
	Alarm configuration	Enable	Checked or not	Enabling of the alarm or not upon change of status of this variable and saving in the alarm log
		Upon any change of status (TSD) or upon active (TSS)	Checked or not	Enabling of the alarm and saving of alarm upon any change of status of the variable (TSD) or upon appearance of the active status (TSS)
		Upon loss of closing (TSD) or upon inactive (TSS)	Checked or not	Enabling of the alarm and saving of alarm upon disappearance of the closed status of the variable (TSD) or upon appearance of the inactive status (TSS)
		Alarm level	Scada Scada + sms Sms + mail	Several possible actions in the event of a retransmission of alarm depending on the defined level
		Delayed alarm	Checked or not	Activates a time delay before sending the alarm
		Delay value	0 to 99	Number of hours, minutes or seconds for the delay before sending the alarm to the Scada
		Hours or Minutes or Seconds	Checked according to choice	Choice of unit for the value of the alarm delay
		Save		Allows the configuration to be acknowledged
		Cancel		Enables return to the preceding configuration

Configuration parameters (cont'd)

Variable configuration Measurement configuration	General parameters	Variable name	No restriction	Name given to variable
		Correction factor	Direct or raw or Direct / 10 to direct / 10000 or Direct x 10 to direct x 10000	Definition of a multiplying factor to be applied to the measurement variable for its correct display in the *Monitoring* page. Allows display in the correct format relative to full scale
		Logical address		Internal No. of the TM assigned automatically by the Flair 200C (unmodifiable)
		Class	(Complete list of all classes)	Allows a variable to be assigned to an existing class
		Access	Administrator Operator Monitoring	Access right for this variable. The variable will be readable or modifiable depending on the type of access configured and the associated access rights
		Internal address		Internal address (unmodifiable)
		External address (Scada)	Format "x" (e.g.: 2) In DNP3: "x,class"	External address used by Scada for this variable
		Unit	No restriction	Unit for display of the variable
		Max. value	Integer	Maximum value that can be taken in practice by the measurement value. NB: the value configured influences the precision of the measurement
		Min. value	Integer	Minimum value that can be taken in practice by the measurement value. NB: the value configured influences the precision of the measurement
	Regular processing	Saving	Checked or not	Enabling of regular saving of the measurement in the measurement log or not
		Period	15 min., 30 min. or 1 h	Measurement saving interval
		Type	Averaged or sampled	Way of calculating the measurement for saving in the measurement log
		Event	Checked or not	Enabling of regular saving of the measurement in the protocol event stack or not
		Call	Checked or not	Enabling of regular sending of the alarm to Scada and saving in the alarm log or not
		Period	15 min., 30 min. or 1 h	Event or call saving interval
	Processing on threshold	Saving	Checked or not	Enabling of saving or not upon exceeding the measurement threshold in the measurement log
		Event	Checked or not	Enabling of saving or not upon exceeding the measurement threshold in the protocol event stack
		Call	Checked or not	Enabling of sending of the alarm to Scada and saving in the alarm log or not upon exceeding threshold
		High threshold	Checked or not	Enabling of high threshold or not
		Low threshold	Checked or not	Enabling of low threshold or not
		High threshold value	No restriction	Value for enabling exceeding of the high measurement threshold
		Low threshold value	No restriction	Value for enabling exceeding of the low measurement threshold
	Dead band	Saving	Checked or not	Enabling of saving or not of upon measurement change in the measurement log
		Event	Checked or not	Enabling of saving or not upon measurement change in the protocol event stack
		Call	Checked or not	Enabling of sending of the alarm to Scada and saving in the alarm log or not following a measurement change
		Method	Fixed Percentage	■ A fixed change in the value of the variable results in an associated processing operation (saving, alarm). ■ A change in percentage of the variable results in an associated processing operation
		Value		Configure the minimum percentage or the minimum measurement variation which will cause processing of the defined records
		Minimum change		Whatever the method (fixed or percentage), a minimum change in the value of the TM is necessary for the variable to be processed (event, alarm, etc.)
	Min. and Max. recording	Active maximum	Checked or not	Saving or not of the maximum measurement reached over the period configured
		Active minimum	Checked or not	Saving or not of the minimum measurement reached over the period configured
		Period	1, 7 or 14 days	Calculation period for min. and max. values
		Save		Allows the configuration to be acknowledged
		Cancel		Enables return to the preceding configuration

Configuration parameters (cont'd)

Settings Menu (cont'd)

Sub-page	*Section*	*Parameters / button*	*Configuration range*	*Comments*
Variable configuration Counters	General parameters	Variable name	No restriction	Name given to variable
		Correction factor	Direct or raw or Direct / 10 to 10000 or Direct x 10 to 10000	Definition of a multiplying factor to be applied to the counter variable for its correct display in the *Monitoring* page. Allows display in the correct format relative to full scale
		Logical address		Internal No. of the CNT assigned automatically by the Flair 200C (unmodifiable)
		Class	(Complete list of all classes))	Allows a variable to be assigned to an existing class
		Access	Administrator Operator Monitoring	Access right for this variable. The variable will be readable or modifiable depending on the type of access configured and the associated access rights
		Internal address		Address for the COM-CPU internal Modbus link (unmodifiable)
		External address (Scada)	Format "x" (e.g.: 2) In DNP3: "x,class"	External address used by Scada for this variable
		Unit	No restriction	Unit for display of the variable
		Max. value	Integer	Maximum value that can be taken in practice by the counter value. NB: the value configured influences the precision of the counter
		Min. value	Integer	Minimum value that can be taken in practice by the counter value. NB: the value configured influences the precision of the counter
	Internal counting	Object type	Digital Analog	Selection of the variable type on which the counter is incremented (Digital or Analog)
		Object	DI1 to DI1000 intDI1 to intDI22	Name of the variable to which the counter is assigned
		Method of counting	Impulse counter Hour counter Integrated counter Average	**For a DI type variable:** ■ Impulse counter: the counter is incremented at each switchover of the variable to high state. ■ Hour counter: the Flair 200C calculates the period during which the variable is in the high or low state. The display in the viewing page is in the form "day,hour,minute,second". ■ Integrated counter: over a given range of time (integration period), the Flair 200C calculates the number of high states of the variable. **For an AI/AO type variable:** ■ Integration counter: the meter is incremented **each second** by the current value of the defined analog variable. ■ Average counter: the counter analyses an analog variable and displays the mean value of the variable over the configured integration period. This function allows smoothing of analogue variables in particular.
		Minimum pulse time	Between 0 and 2000 ms in increments of 10 ms	Pulse length (in ms) after which the Flair 200C will consider a state as high
		Inhibition time past zero		Period during which the Flair 200C inhibits pulse detection after zero crossing by the variable. This filter makes it possible to avoid possible rebounds in the event of a return to zero
		Integration period	Between 0 and 86400 s	Useful period of the measurement in the case of an integrating meter (DI type variable) or mean (AI type variable)
		Scale factor	Between 0 and 10000	Used in the case of a pulse counter. Weight of the pulse sent. With each pulse sent, the counter value is incremented in accordance with the conversion factor
		Active state		Field used only in the case of a time counter State of the variable (high or low) which activates the time counter
	Regular processing	Saving	Checked or not	Enabling of regular saving of the counter in the measurement log or not
		Event	Checked or not	Enabling of regular saving of the counter in the protocol event stack or not
		Call	Checked or not	Enabling of regular sending of the alarm to Scada and saving in the alarm log or not
		Period	15 min., 30 min. or 1 h	Counter saving interval
	Processing on threshold	Saving	Checked or not	Enabling of saving or not upon exceeding the counter threshold in the measurement log
		Event	Checked or not	Enabling of saving or not upon exceeding the counter threshold in the protocol event stack
		Call	Checked or not	Enabling of sending of the alarm to Scada and saving in the alarm log or not upon exceeding threshold
		Value	No restriction	Value for enabling exceeding of the high counter threshold

Configuration parameters (cont'd)

	Dead band	Saving	Checked or not	Enabling of saving or not upon counter variation in the measurement log
		Event	Checked or not	Enabling of saving or not upon counter variation in the protocol event stack
		Call	Checked or not	Enabling of sending of the alarm to Scada and saving in the alarm log or not following a counter change
		Value as %	0 to 255	% variation of the counter for the dead band criterion
		Save		Allows the configuration to be acknowledged
		Cancel		Enables return to the preceding configuration
Class management		Recycle bin	Checked or not	Selection of class to be deleted or not
		Monitoring	Checked or not	Selection or not of class display in the *Monitoring* page
		Class name	No restriction	Class name to be displayed
		Save		Allows a modification or a creation to be saved for each class
		Delete		Allows a class that has been selected earlier to be deleted

General characteristics

Power supply			
Power supply	Characteristics		120/240 Vac –20% +10%; 50/60 Hz, max. consumption: 170 mA
Battery	Type		Sealed spiral lead maintenance-free type: 4 V; 2.5 Ah
	Charging time		24 h
	Charger capacity		4 Vdc; 250 mAh
	Battery life from –20°C to +70°C		Minimum 4 h (minimum 3 h with Ethernet option)
	Supervision		Against total discharge, regular tests performed
	Lifetime at 20°C		10 years
Measurement characteristics			
Type of measurement	Type A		I1, I2 and I3: true RMS up to H15 V1, V2, V3: phase 1 measured up to H15 2 other phases calculated up to H1 I0: calculated from the formula I1 + I2 + I3 (H1 values) Iaverage 3I: calculated from I1, I2 and I3
	Type B/C		I1 and I3: true RMS up to H15 I0: true RMS up to H3 V1, V2, V3: true RMS up to H15 I2: calculated from I0, I1, I3 (H1 values) Iaverage 3I: calculated from I1, I2 and I3
	Number of samples		36 samples/period (60 Hz or 50 Hz)
Measurement precision at 25°C	Current	Standard MF1, MHF sensor (2200 turns)	5% from 45 mA to 227 mA (⟷100 A to 500 A)
		High-performance sensor (500 turns)	2% from 200 mA to 1 A (⟷100 A to 500 A)
		Without toroids	0.5% from 100 A to 500 A (if configured 1/2200 or 1/500)
	Voltage		1% from 90 to 265 Vac
	Power factor (without toroids)		±1% at 600 A with 0.707 < |PF| < 1 on channel 1 ±5% at 600 A with 0.707 < |PF| < 1 on channel 2 (*)
	Frequency	50 Hz	±0.02 Hz from 48 Hz to 52 Hz
		60 Hz	±0.02 Hz from 58 Hz to 62 Hz
	Power (active/reactive) (without toroids)		±1% at 600 A with 0.707 < |PF| < 1 on channel 1 ±5% at 600 A with 0.707 < |PF| < 1 on channel 2 (*)
	Active energy		Precision not specified
	Reactive energy		Precision not specified
Period	Refresh period		1 s
Voltage input	Input range		From 20 Vac to 265 Vac (P-N connection)
	MV/LV transformation ratio		Primary: 100 to 36000 V Secondary: 90 to 270 V
	MV/LV transformer phase shift		From 0 to 11 (in h)
	Frequency measuring range		From 38 Hz to 67 Hz
Current inputs	Input range	2200-turn toroids	Phase: from 910 µA to 363 mA (⟷ 2 A to 800 A) Homopolar: from 910 µA to 73 mA (⟷ 2 A to 160 A)
		500-turn toroids	Phase: from 4 mA to 1.6 A (⟷ 2 A to 800 A) Homopolar: from 4 mA to 320 mA (⟷ 2 A to 160 A)
	Maximum direct current accepted at input		6 A
Fault detection without PowerMeter option at 25°C	Imax phase fault	2200-turn toroids	±10% from 9 mA to 363 mA (⟷ 40 A to 800 A)
		500-turn toroids	±7% from 40 mA to 1.6 A (⟷ 40 A to 800 A)
	I0 earth fault	2200-turn toroids	±10% from 910 µA to 73 mA (⟷ 2 A to 160 A) (**)
		500-turn toroids	±7% from 4 mA to 320 mA (⟷ 2 A to 160 A) (**)
Fault detection with PowerMeter option at 25°C	Imax phase fault	2200-turn toroids	±5% from 9 mA to 363 mA (⟷ 40 A to 800 A)
		500-turn toroids	±2% from 40 mA to 1.6 A (⟷ 40 A to 800 A)
	I0 earth fault	2200-turn toroids	±5% from 910 µA to 73 mA (⟷ 2 A to 160 A) (**)
		500-turn toroids	±2% from 4 mA to 320 mA (⟷ 2 A to 160 A) (**)
Temperature	Interior temperature		±2°C from -20°C to +70°C
	Estimated exterior temperature		Interior temperature –9°C

(*): The precision discrepancy between channels 1 and 2 is due to the lack of U measurement on channel 2.
(**): Thresholds from 2 A to 20 A possible only in B/C type setup.

General characteristics (cont'd)

Equipment characteristics			
Inputs/Outputs	6 inputs		Non-insulated; Dry loop polarized at 5 V internally
	3 outputs		Insulated (50 Hz/1 min.): 1.5 kV 30 VA; Max. 60 Vdc or 125 Vac
Dielectric	AC supply input		Insulation (50 Hz/1 min.): 10 kV Surge (1.2/50 µs): 20 kV
	Toroid input		Insulation (50 Hz/1 min.) : 2.5 kV Surge (1.2/50 µs): 5 kV
Electromagnetic	Rapid transients	IEC 61000-4-4	±4 kV on mains, sensor and RS485 (criterion A) ±2 kV on logical inputs/outputs and external indicator terminal (criterion A) ±1 kV on GSM/GPRS antenna (criterion B)
	Electrostatic discharge	IEC 61000-4-2	Level 3; 8 kV air; 6 kV contact (criterion A)
	Radiated electromagnetic field	IEC 61000-4-3	80 MHz; 3 GHz; 10 V/m (criterion A)
	Radio frequency in common mode	IEC 61000-4-6	0.15 MHz to 80 MHz; 10 Vac (criterion A)
	50 Hz magnetic field	IEC 61000-4-8	30 A/m continuous-duty and 300 A/m 1 to 3 s (criterion A)
	Surge	IEC 61000-4-5	2 kV level 3 in common mode (criterion A) 1 kV level 2 in earth leakage protection mode (criterion A)
	Immunity to voltage dips	IEC 61000-4-11	Voltage dip: ■ 30% reduction for 0.5 period (criterion B) ■ 60% reduction for 5 periods (criterion C) ■ 60% reduction for 50 periods (criterion C) Power cuts: ■ greater than 95% 250 periods (criterion C)
	Pulse magnetic field immunity	IEC 61000-4-9	1000 A/M level 4 (criterion A)
	Damped oscillatory wave immunity	IEC 61000-4-12	Level 3: (criterion A) ±2.5 kV in common mode ±1 kV in earth leakage protection mode
Climatic	Temperature	IEC 60068-2-1 IEC 60068-2-2	–20°C to +70°C
	Relative humidity	IEC 60068-2-30	95%; 144 h (6 cycles from 12 h to 55°C +12 h to 25°C)
	Salt spray test	IEC 60068-2-11	168 h
Mechanical	Storage temperature	IEC 60068-2-14	–40°C to +70°C; maximum variation of 5°C per min.
	Cubicle material		Polycarbonate
	Vibrations	IEC 60068-2-6	10 to 2000 Hz; 2 g peak-to-peak
	Dimensions	H x W x D	333.5 x 210 x 104 mm
	Weight (typical)		2.5 kg
	Protection	IEC 60529	IP21 (IP2X when cubicle open); IK07

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Trade references

Product		
Flair 200C 1 channel		**F201A**
Flair 200C 2 channels		**F202A**
Flair 200C PowerMeter option 1 channel		**F201B**
Flair 200C PowerMeter option 2 channels		**F202B**

Power supply option		
Standard power supply		**A**

Protocol		
Modbus serial and TCP		**M2**
IEC 101 and 104		**I2**
DNP3 serial and TCP		**D2**

Modem		
RS232	Non-insulated	**2**
GSM/3G	Five band with GSM antenna supplied Cable length 5 m	**3**
RS232/485	Insulated at 2.5 kV	**4**
GSM/GPRS	Quadriband with GSM antenna supplied Cable length 5 m	**G**
PSTN V32	Insulated at 8 kV	**F**
FSK	FSK radio modem V23 - 600-1200 baud	**B**
FFSK	FFSK radio modem 1200-2400 baud	**C**

Ethernet option		
No ETH	Ethernet interface absent	**Z**
ETH	Ethernet interface present	**E**

Modbus local area network		
No LN	Modbus local area network option absent	**Z**
Modbus LN	Option present. RS485 card insulated at 2 kV	**R**

Type of detection		
AMP	Conventional ammetric type detection	**A**
ICC	Detection by ICC algorithm	**D**
None	No detection	**Z**

Reserved		
Reserved		**Z**
Programmable Logic Controller RTU Control		**P**

Languages		
FR	French	**Z-FR**
EN	English	**Z-EN**
SP	Spanish	**Z-SP**
PO	Portuguese	**Z-PO**
CH	Chinese	**Z-CH**
GE	German	**Z-GE**
TU	Turkish	**Z-TU**

Standard sensors: split toroids - IP20		
Standard toroids Type A setup	Toroid kit, 3 MF1 split phase toroids + connection cable	**59968**
Standard toroids Type B setup	Toroid kit, 2 MF1 split phase toroids + 1 MFH zero sequence toroid + connection cable	**MV258152**
Standard toroids Type C setup	Toroid kit, 1 MFH split zero sequence toroid + connection cable	**MV258153**

High-performance sensors: resin-coated toroids - IP43		
High-performance toroids Type A setup	Toroid kit, 3 split phase toroids + connection cable	**MV258171**
	Toroid kit, 3 closed phase toroids for RM6	**MV258172**
High-performance toroids Type B setup	Toroid kit, 2 split phase toroids + 1 zero sequence toroid + connection cable	**MV258173**
High-performance toroids Type C setup	Toroid kit, 1 split zero sequence toroid + connection cable	**MV258174**

Notes

Notes

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